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VETERINARY MEDICINE

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Chicago

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By B. F. KAUPP

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By C. W. PURCELL

Parasitic Diseases of Domestic Fowls
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Veterinary Medicine

Vol. XVI MAY, 1921 Number 5

Editorial Comment

TEMPERAMENT AND TEMPERATURE.

The following is a sequel to our editorial in the April issue of VETERINARY MEDICINE under the caption of "No Lesion Tuberculin Reactors?" Doctor Beach's letter, together with our reply, should aid in clarifying a puzzling and misleading condition in connection with the tuberculin test of cattle, or at least it should so direct thought and controversy as to help the situation.

We know the ideas promulgated are not new to many, but they evidently will be to some. We believe, however, that as tuberculosis eradication is one of the paramount subjects of the day in veterinary medicine that statements here given should be a leading theme for discussion by those who are engaged in this kind of work.

Following is the communication from Dr. B. A. Beach, associate professor of veterinary science at the University of Wisconsin:

I am much interested in your editorial in the April number of VETERINARY MEDICINE, entitled "No Lesion Tuberculin Reactors?" We heartily agree with this attitude in the main. It calls to mind, however, an incident that occurred recently. We went to northern Wisconsin to test a herd of about 40 animals for Johne's disease, arriving at the farm about 5 o'clock in the afternoon. We took a preliminary temperature at 5:30. One of these animals had a temperature of 103.8. Two more were slightly elevated, the highest being 103.2, and the other 102.8. Clinically there was nothing wrong that we could observe. All of the animals were feeding normally, and all gave the normal amount of milk. The next preliminary temperature revealed the same condition. Instead of injecting the balance of the herd, as is the usual practice, we decided to wait until morning. Our first temperature reading in the morning revealed eight with 104 or higher. The next temperature got three more. These temperatures ranged from 104 to 105.8, many of them giving a typical curve, returning to normal around 4 o'clock in the afternoon.

The surprising thing about this herd is the fact that at no time were any of these animals in question, off feed, and they gave the normal amount of milk both morning and evening. They weigh the milk very carefully on this farm, and I took occasion to observe all of the readings on this milk chart. Had we injected these animals with either Johnin or tuberculin, we would have observed eleven reactors independent of any that a diagnostic agent might have caused. We are at a loss to explain this incident, except possibly in this way: A couple of days prior to my visit they had emptied one silo and started feeding from another, after discarding the dry and moldy silage from the top, as is the usual practice. The silage contained very little mold, and was much better than some we have seen that apparently caused no disturbance. Had we been shown this silage without knowing any of the conditions on this farm, we should have thought that it was all right.

On another farm in Wisconsin where the cattle were tested for tuberculosis the veterinarian found six with temperatures over 103. He injected the balance of the herd and got five reactors. Three of these reactors were slaughtered and no lesions were demonstrated. This herd had been tested for many years previous without finding any reactors, and no animals have been introduced except an occasional purebred sire. We are wondering whether the five animals in question did not show high temperatures the following day for the same reason that the six did on the day previous.

We thought you might be interested in the two incidents recorded above. You understand we are not saying that a reaction does not always mean infection with tuberculosis. We are sometimes at a loss, however, to correlate the above statement with the two incidents mentioned above.

This communication suggests more extended discussion of the relative value of the thermic and intradermal tuberculin tests. This could not be done in the former editorial on account of the necessity of lengthy treatment.

In the category of animals coming under the scope of the veterinarian there are two species that are often considered as temperamental as grand opera singers, and they are the dog and her ladyship, the cow, or his lordship, the bull. One has to weigh carefully the value of temperature readings in either of these two animals for any purpose.

For several years, or almost since the advent of the intradermal test, there have been many advocates of it, and it has been prophesied that some day it would be the official tuberculin test, perhaps in conjunction with the ophthalmic test. The day will probably come when the thermal test will become obsolete.

The editorial referred to states: "It is our opinion that when a positive reaction results from

the tuberculin test that there must be and that there is always tuberculosis present." Perhaps this statement should be emphasized by explaining just what is meant by a positive reaction. There should be absolutely no doubt as to the reaction when animals are given the tuberculin test. With an apparently high normal temperature of 103 to 104 degrees, no matter how characteristic the post injection temperature may be, such a test should not be considered a positive reaction unless accompanied by marked systemic reaction; in other words, the thermic reaction will practically have to be disregarded. A typical rainbow curve of temperature alone, if there was a so-called high normal temperature, does not give a positive reaction.

Cattle are temperamental. It is a well-known fact that a stranger or several strangers among cattle may cause excitation of their nervous systems to such an extent that this will be demonstrated by an elevation of temperature. A case in point is one in which temperature readings were taken four times during one visit. The animal in question was a fine Guernsey cow in excellent condition. However, the cow was found to be quite nervous and was taken from the yard and put into a large box stall. A careful examination was made and no symptoms of any ill conditions were found. Her temperature was taken against considerable resistance and found to be 105.2 degrees. This surprising figure drew the conclusion, based on similar past experience, that she was affected by strangers and that this was the reason for her exalted temperature. Instructions were given to the caretaker as to the method of taking the temperature, and after a wait of 20 minutes he went into the box stall alone and found the temperature to be 101 5 degrees. The caretaker was again stationed at the animal's head and the practitioner again met resistance, the reading being 105.5 degrees. After another wait of 20 minutes the caretaker took another reading alone, 101.8 degrees being the result. This alternation of temperature taking was repeated two more times with practically the same readings. On the post injection temperatures the practitioner took the first one, which was 104.5 degrees; then the caretaker took the remaining ones. The result was negative, without a doubt. Had the practitioner continued to take the temperature readings the results would have indicated either a positive or a doubtful reaction, leaving the cow at least in the category of being a "suspect."

The foregoing will undoubtedly explain what is meant by a positive reaction, that is, where there can be no conjecture as to the reaction. Naturally, when the practitioner encounters such freak temperatures there must be doubt when making the tuberculin test. But when one becomes familiar with the intradermal test the doubtful cases need be but few, indeed.—E. L. Q.

FARM BUREAU AND VETERINARIAN.

Under the above heading the *Orange Judd Farmer* recently published an editorial indicating its position in regard to vaccination of hogs by veterinarians and by the Illinois farm bureaus. Veterinarians will be interested in the attitude taken by this publication.

Comment has come to us about our recent article on the meeting of veterinarians in Champaign, at which it was stated that farm bureau vaccination of hogs is considered likely to decrease instead of increase, and to be found an unprofitable expenditure of the energies of the farm bureau.

Perhaps we may state just where we stand on the matter.

The farm bureau is the farmer's organization, created to serve him. It is entirely possible that in some counties there has been inadequate veterinary service, either by reason of lack of skilled men, overcharges or careless work. Not all counties are blessed with expert and conscientious veterinarians.

In such a case, assuming that they are sure of the facts, it is manifestly the duty of the farm bureau to take the matter in hand. However, it is our opinion that such vaccinating work should be considered only a temporary recourse, pending the establishment of reliable and expert practicing veterinarians.

We have only praise for any farm bureau that has provided for its farmers in such an emergency. But it would be unfortunate, would it not, if a farm bureau were to jump to conclusions too hastily, and to actually force out of business a skilled, hard working, conscientious practitioner?

And would it not react eventually against the farm bureau if cold figures should show that the cost of vaccination, performed by the farm bureau, was greater than the cost of the same vaccinating by the practitioner, and that the percentage of unfavorable results was as great or possibly greater?

DISSATISFACTION.

You must be dissatisfied if you would be progressive. The satisfied man is always only one of the herd animals, while the dissatisfied man is or will be the herd leader.

The satisfied man is the man who only follows, who never originates, and who never improves. The dissatisfied man is the one on whom the world must depend for progress in all things of life. He is the thinker, the worker, the originator, the improver.

The Alimentary Canal of Birds

By B. F. KAUPP
State College Station, Raleigh, N. C.

THE food, after being imbued with the secretions of the glands of the mouth, is poised upon the tongue and swallowed, partly by means of the pressure of the tongue against the palate and partly by a sudden upward jerk of the head. The posterior apertures of the nostrils, being generally in the form of narrow fissures, are undefended by a soft palate or uvula, and the laryngeal aperature, which is of similar form, is in like manner uprovided with an epiglottis, but is defended by the retroverted papillae at the base of the tongue.

In many birds such as the albatross and coot, there is a small cartilage in the usual place of an epiglottis, but insufficient to cover more than a very small part of the laryngeal aperature. The surface of the mouth is rarely smooth above, but is commonly provided with retroverted papillas; similar mechanical helps to the right course of the food occur at or near the fauces, in addition to those already noted on the tongue.

The width of the mouth in the caprimulgus and the length and depth due to the mandibular pouch of the pelican are remarkable. The extensibility of the membrane between the rami of the lower jaw admits of its formation into a bag, which is calculated to contain ten quarts of water, and serve as a receptacle for fishes, making in that state a conspicuous appendage to the huge bill; when empty it can be contracted so as to be hardly visible. By means of this mechanism a quantity of food can be transported to the young; and, as in disgorging the bleeding fishes the parent presses the bottom of the sac against her breast, this action has probably given rise to the fable of her wounding herself to nourish the young with her own blood.

The swift presents an analogous dilatation of the faucial membrane at the base of the lower jaw and upper part of the throat. It is most developed at the period of rearing the young, when it is generally found distended with insects in the old birds that are shot while on the wing. A similar structure obtains in the rook, and probably in other insectivorous birds. It is notable in the nutcracker, which, descending from its favorite snowy altitudes, may be seen to return with a swelling like an enormous goitre as big as the head, formed by the gular pouch being crammed with nuts.

The Esophagus.

The esophagus, like the neck, is usually very long in birds. As it passes down it generally inclines toward the right side. It is partly covered by the trachea, and connects to the surrounding parts by a loose cellular tissue. It is wide and dilatable, corresponding to the imperfection of the oral instruments as comminutors of the food. In the rapacious birds and especially in the piscivorous birds it is of great capacity, enabling the latter to swallow the fishes entire, and serving also in many waders and swimmers as a temporary repository of food.

When the cormorant has by accident swallowed a large fish which sticks in the gullet it has the power of inflating that part to its utmost, and while in that state the head and neck are shaken violently, in order to promote its passage. In the gannet the esophagus is extremely capacious, and, as the skin which covers it is equally dilatable, five or six herrings may be contained therein. In both these species it forms one continual canal with the stomach. In the flamigo, on the contrary, the diameter of the gullet does not exceed half an inch, being suited to the smallness of the objects which constitutes the food of this species.

Regurgitation in Birds.

Besides deglutition, the esophagus is frequently concerned in regurgitation; and in the birds in which this phenomenon occurs the muscular coat of the gullet, like that of ruminants, is well developed. The raptores, (birds of prey, such as hawks) for example, habitually regurgitate the bones, feathers and other indigestible parts of their prey, which, in the language of falconry, are called "castings." The esophagus possesses an external cellular covering, a muscular coat, an internal vascular tunic, and a cuticular lining. The muscular coat consists of two layers of fibers; in the external stratum they are transverse and in the internal longitudinal. The mucous coat

is generally disposed in longitudinal folds, rarely connected by transverse folds, still more rarely villous, as in the ostrich.

Omnivorous Birds.

In those birds which are omnivorous, as the toucans and hornbills, in the frugivorous and insectivorous birds, and in most of the grallatores, (such as the crane and stork) which find their food in tolerable abundance and take it in small quantities without any considerable intermission, it passes at once to the stomach to be there successively digested, and the gullet presents no partial dilatations to serve as a temporary reservoir or macerating receptacle. But in the larger raptorial birds, such as the eagles and vultures, which gorge themselves at uncertain intervals from the carcasses of bulky prey, the esophagus does not preserve a uniform width, but undergoes a lateral dilatation anterior to the furculum at the lower part of the neck. This pouch is termed the ingluvius or crop.

The Crop.

In those birds, the food, which is exclusively of the vegetable kind, as grains and seeds, and of which a great quantity must be taken to produce the adequate supply of nutriment, and where the cavity of the gizzard is very much diminished by the enormous thickness of its muscular coat, the crop is more developed, and takes a more important share in the digestive process. Instead of a gradual lateral dilatation of the gullet, it assumes the form of a globular or oval receptacle appended to that tube, and rests upon the elastic fascia which connects the clavicles or two branches of the furculum together.

In the common fowl the crop is of large size and single, but in the pigeon it is double, consisting of two lateral oval cavities.

The dilatation of the esophagus to form the corp is more gradual in ducks than in gallinaceous birds, such as pheasants, turkeys and chickens. The crop is wanting in swans and geese, but is present in that modified anserine, the flamingo.

The disposition of the muscular fibers of the crop is the same as in the esophagus, but the muciparous follicles of the lining membrane are larger and more numerous. This difference is most conspicuous in the ingluvies of the gramnivorous birds, where it is not merely a temporary reservoir, but in which the food is mixed with the abundant secretion of the glands, and become softened and macerated, and prepared for the triturating action of the gizzard and the solvent power of the gastric juice.

Food Changes Occurring in the Crop.

The change which the food undergoes in the crop is well known. If a pigeon be allowed to swallow a great quantity of peas, they will swell to such an extent as to almost suffocate.

The time during which the food remains in the crop depends upon its nature. In the common fowl animal food will be detained about 8 hours, while half the quantity of vegetable substances will remain 16 to 20 hours. Many interesting observations have been made on pigeons, which takes on a secreting function during the breeding season, for the purpose of supplying the young pigeons in the callow state with a diet suitable to their tender condition. An abundant secretion of a milky fluid of an ash-gray color, which coagulates with acids and forms curd, is poured out into the crop and mixed with the macerating grains. This phenomenon is the nearest approach in the class of birds to the characteristic mammary function of a higher class; and the analogy of the "pigeon's milk" to the lacteal secretion of the mammalia has not escaped popular notice. The canal continued from the crop to the proventriculus or first portion of the stomach is the second portion of the esophagus. At its commencement it is narrower and more vascular than that part which precedes the crop, but gradually dilates into the first or glandular division of the stomach known as the proventriculus.

The Proventriculus.

The proventriculus of the birds, like the spiral valve of the shark, is an alimentary surface packed into the smallest space; in the latter the membrane is chylific, in the former chymific or digestive. Every follicle is, in fact, a portion of the peptic secreting surface, with its gastric tubuli at right angles thereto, the surface being moulded to form either a simple or compound cavity.

In birds with a wide esophagus the commencement of the proventriculus is not indicated by any change in the direction or diameter of the tube, but only by its greater vascularity, by the difference of the lining membrane, and the stratum of glands which opens upon its inner surface, and which are its essential characteristic.

The proventriculus varies in form and mag-

nitude in different birds. In the rasores, (fowls such as pheasants, turkeys and chickens) it is larger than the esophagus, but much smaller than the gizzard. In euphones (song birds) it forms almost the entire stomach, the gizzard being miniature. In alcedo (perching birds) opposite proportions prevail. In the psittacidae and ardeidae, the parrot and stork, it is larger than the gizzard and of a different form. In the ostrich the proventriculus is four or five times larger than the triturating division of the stomach, being continued down below the liver, and then bent up upon itself toward the right side before it terminates in the gizzard, which is placed on the right and anterior part of the dilatation.

The Gastric Glands.

In the majority of birds the gastric follicles are simple, having no internal cells, dilated fundus or contracted neck, but from their external blind extremity proceed with a uniform diameter to their internal orifice. This form obtains in the zoophagous and omnivorous birds. In the dove class the follicles are of a conical shape; in the swan they are tubuliform; in the goose and turkey they present internal loculi; in the ostrich and rhea these loculi are so developed that each gland forms a racemose group of follicles, terminating by a common aperature in the proventriculus.

The gastric glands are variously arranged. Among the raptores we find them in the golden eagle disposed in the form of a broad compact belt; in the sparrowhawk this belt is slightly divided into four distinct portions.

In the insessores (most of the common singing birds) the glands are generally arranged in a continuous zone around the proventriculus; but in some of the syndactyli, as the hornbill, the circle is composed of the blending together of two large oval groups.

Among the scansores the parrots have the gastric glands disposed in a continuous circle, which is at some distance from the small gizzard. In the woodpeckers the glands are arranged in a triangular form, with the apex toward the gizzard. In the toucan they are dispersed over the whole proventriculus, but are more closely aggregated near the gizzard; the lining membrane of the cavity is reticulate, and the orifice of the glands are in the interspace of the meshes.

Among the rasores the pigeon shows its affinity to the passerine birds (singing and non-singing perching birds) in having the gastric glands of a simple structure and arranged in a zonular form; they are chiefly remarkable for their large cavity and wide orifice. In the common fowl and turkey the glands are more complex, and form a complete circle.*

The natatores (water birds such as sea gulls and geese) present considerable differences among themselves in the disposition of the solvent glands. In the cormorant they are arranged in two circular spots, the anterior one and the posterior one, while in the closely allied genus Sula, or gannet, they form a complete belt of great width, and consequently are extremely numerous.

In the seagulls the gastric glands form a continuous zone; and in the little awk they are spread over a great proportional extent of surface, and the form of the digestive organs is peculiar. The proventriculus is continued from the esophagus, with a very glandular enlargement, below the liver, and is then bent up to the right side, and terminates in the gizzard. The solvent glands are situated at the anterior or upper part of the cavity everywhere surrounding it, but lower down they lie principally upon the posterior surface, and where it is bent upward toward the right side they are entirely wanting. In the gramniverous lamellirostral water birds, as the swan, goose, etc., the gastric glands have a simple elongated form, but have an irregular or cellular internal surface; they are closely arranged so as to form a complete zone.

The Gizzard.

In general the muscular or pyloric division of the stomach called "gizzard" immediately succeed the glandular or cardiac division; but in some birds, as the awk and parrot, there is an intervening portion without glands.

The gizzard is situated below the liver, on the left side of the abdomen, generally resting on the mass of intestines. In the owl the gizzard adheres to the membrane covering the internal surface of the abdominal muscles; but in most birds it has a more dorsal position.

In all birds the gizzard forms a more or less lengthened sac, having at its upper part two apertures. One of these is of large size, communicating with the proventriculus; the second is in close proximity with, and to the right side of the preceding, leading to the

*"Anatomy of the Domestic Fowl," by B. F. Kaupp, 1918, pub. W. B. Saunders.

duodenum; below these apertures the cavity extends to form a cul-de-sac. At the middle of the anterior and posterior parts of the cul-de-sac there is a tendon from which the muscular fibers radiate.

The differences in the structure of the gizzard resolve themselves into the greater or less extent of the tendons, and the greater or less thickness of the muscular coat, and of the lining membrane.

In the raptores the gizzard assumes the form of a mere membraneous cavity, in accord with the animal and easily digestible nature of their food. The muscular coat is thin; the fibers principally radiating from small tendons, and there are some longitudinal fibers beneath the radiating or external layer.

In the rasores and lamellirostral natores it exhibits the structure to which the term gizzard can be more appropriately applied. The muscular fibers are distinguished by their unparalleled density of texture and deep color, and are arranged in four masses; two are of a hemispherical form, and their closely packed fibers run transversely to be connected to very strong anterior and posterior tendons. They constitute the sides of the gizzard, and are termed the digastric muscles or "musculi laterales." Between these, at the end of the gizzard, are the two small thin muscles called the "musculi intermedii." There are likewise irregular bands placed about the circumference of the gizzard.

The internal coat of the gizzard is extremely hard and thick, and is of a horny nature, and may be increased by friction and pressure. As it is most subject to these influences at the parts of the gizzard opposite the musculi laterales two callous buttons are formed. It is here that the fibrous structure of the lining membrane can be most plainly seen. Elsewhere the cuticular lining is disposed in ridges and prominences, which vary in different birds, but are pretty constant in the same species.

The cavity of the gizzard is so encroached upon by the grinding apparatus that it is necessarily very small, the two horny callouses having their internal flat surface opposed to one another, like millstones.

Pigeons carry gravel to their young. Gallineaceous birds grow lean when deprived of pebbles.

The Intestines.

The intestines reach from the stomach to the cloaca; in relative length they are much shorter than in mammalia. In the toucan the whole length of the intestine is scarcely that of the length of the body. In the fowl of 6 pounds weight it is, on an average, about 56 inches long. The canal is divided into small and large intestines, sometimes by an internal valve, sometimes by the insertion of a single caecum, but most generally by two caeca, which are always opposite one another. The small intestines and caeca are longest in the vegetable feeders. The large intestine is, with one or two exceptions, very short and straight in all birds.

Immunity to Tuberculin*

By C. W. PURCELL.

WHAT is too small and what is too large a dose of tuberculin? It seems to be a well-established fact that animals acquire an immunity to tuberculin. Whether from one or more injections or whether from too large a dose is not as clear as it should be.

As practicing veterinarians we have little time to devote to experimentation to determine these things for ourselves and have to depend upon those we assume have the knowledge and who, in turn, may be depending upon someone else for their authority. Those of us who work under the direction of live stock sanitary commissioners work in accord with their directions. Those of us who work under the co-operative eradication plan work under others from whom we receive our instructions.

This seems to be in direct contradiction to all our other activities. As students we get our knowledge from text books, from the teaching force and from the various clinical opportunities connected with the schools which we attend. When we go out to practice we have to use this acquired information to the best of our ability, but it is ever tempered by the practical application, and governed by the absolute results. What we regard as good we treasure up, and what we regard as unsuited to our cases we discard, and

* Read at a meeting of the Maine Veterinary Medical Association, Jan. 12, 1921.

at the end of a certain period we are, so to speak, made over.

Necessity of System in Tuberculin Testing.

Where there is a large working force connected with what is usually spoken of as field work there must necessarily be some system to the work, some method that is common to the whole force, so that common results may be obtained, collated, arranged, deductions made therefrom, and a comprehensive survey of the whole matter, to the end that those in charge may be assured that what is best is being observed, and what is not for the best may be dropped from sight.

One can easily see that in taking up tuberculin testing he is changing from the individual of independent thought or independent action to the unit of a system in which others think for him, and where he acts in accord with the view of others, rather than in relation to his own. This is where it is difficult for some veterinarians who do little testing, and have preconceived opinions of their own in regard to the test, to accept all the regulations in regard to the test, as laid down by those in authority, and accept these regulations as the best and as necessary for the final result.

System tends towards exalting the man at the top and depressing the man at the bottom, and yet we could not get along without it if we are to avoid chaos. It is absolutely necessary to have system if we make any advances, for it is only the collective result that brings the truth to the surface. Independent action would land us no where.

Among the workers in any system there is always, or should be if they are of the right kind, some independent thought going on, some analysis of the operations taking place as to this or that, and some individual deductions made as to the right or wrong of a thing, and that is why I am offering this paper. Not in criticism and certainly not in obstructive tactics is it offered, but in hopes of bringing some new thought to the surface.

Attitude Toward Progressive Increases in Dosage.

If one will follow the various tuberculosis eradication conferences he will be struck with the inevitable attitude there taken towards a progressively increased dosage of tuberculin. The tendency from a 2-c.c. dose in 1893 to a 20-c.c. dose in 1920 has not been accepted by many progressive veterinarians as correct, but has been urged by those who had this dread of immunity to the smaller dose. The subcutaneous test has been the standard for many years, and to maintain this test, with its occasional breaks, it has been thought best to increase the dosage, as a dread of immunity to the small dose seems to have kept some people awake nights.

It has only been by increasing the size of the dose that they have felt safe in testing animals that had been tested one or more times by the subcutaneous test. The cry has been "use plenty of tuberculin," and while as an employe under orders I have been following instructions and using the increased dose, the question has arisen in my mind as to what the future is to bring forth. For example, if a two-year-old animal is to receive 5 cc., a four-year-old 8 cc., a six-year-old 10 cc., an eight-year-old 12 cc., and a twelve-year-old 15 to 20 cc., as recently advocated at the Philadelphia conference, to my mind such animal is on the high road to immunity to any dose.

Today it is recognized that some animals will react to any test, that some diseased animals will not react to any test, and some will react to one test and not to another. It is yet to be demonstrated how far the failure to react to the ophthalmic or intradermal test is influenced by prior injections of tuberculin subcutaneously, which have produced an immunity.

It is a broad question as to whether the progressively large dose of tuberculin, which today is being insisted on, is not to produce an immunity to all cattle subjected to it, so that shortly we are to have a condition where no tests are to be reliable. In other words, if this dose of tuberculin is to be progressively increased in the next few years, as it has been in the last few, are we to have a cattle population entirely immune to the subcutaneous test, and, if so, are they going to be immune against all tests by tuberculin?

This subject of immunity is a very difficult one to enter into without becoming involved in a very technical discussion. It is well for us to confine ourselves to but one phase of the question, which is this: Where the bureau absolutely refuses to retest an animal that has once properly reacted to the tuberculin test, it is from fear that immunity may have been established and that no other reaction may be obtained, thus creating an awkward situation. Granting this position to be correct—and it is fully granted—is it not reasonable to argue that the larger the dose the more tendency to immunity?

There are properties to tuberculin that are not

as well understood as might be wished. According to the government News Letter, 74 herds of cattle were removed from the accredited list because of the finding of one or more reactors in the herd. The News Letter states that in all but five of the herds the apparent reason for the presence of the disease was found. These apparent reasons consisted of running in pastures with infected cattle, having animals of doubtful health brought onto the premises and stabled with the others (and yet these doubtful ones had been subjected to the tuberculin test), and suspicious ones.

Many of the herds were found to have had new arrivals added to them, but which had been tested before they were placed in the herd. Of how far these new animals after one test were found to be affected and how far members of the original herd were affected, nothing is said. Did immunity play any part in the first test of the newly added animals in these herds, or was it carelessness?

Results of Tuberculin Testing in Maine for Twenty-Five Years.

If after all known precautions have been taken diseased animals have escaped us, how are we to account for it? Tuberculin testing has been going on in Maine for 25 years. From 1900 to 1910 more than 130,000 cattle were tested; from 1910 to 1920 the records are not clear. From personal observation Oxford County has been soaked with tuberculin for 15 years, retesting every year by the subcutaneous method. How far are we to be influenced in the future by what has gone before?

Many years ago Dr. Russell of the Maine State College wrote me that he had formed a theory that one-tenth of the then ruling dose of 2 cc. would be as effective as the full dose, and as I was in a position where I was doing more than the ordinary amount of testing, he would like to have me try out the matter and report results to him. At the time Koch tuberculin was costing about 65 cents per dose, and if one-tenth would do the work it was quite a saving in money. This was followed for nearly six months; then the dose was changed to one-fourth, and used for two years. Quoting from memory, I would say: Reactors averaged nearly 10 percent of those tested. Temperature always ran from 106 to 107. There were never any doubtful ones around 103 plus. Post-mortems were always satisfactory, even to a greenhorn.

As this was more than 25 years ago, I may be a little bit hazy, but one thing remains clear to my mind, and that is that wherever we took out reactors and cleaned up the premises we found a healthy herd the next year when we went back, proving to me that one-tenth of the dose or one-fourth of the dose was sufficient. As to the tuberculin itself, as compared with the present B. A. I. tuberculin, I have no knowledge. But it seems to me that large dosage is creating suspicion in the minds of the owners.

Cleaning Up Work Important in Tuberculosis Eradication.

During these later years I have many times wondered how we succeeded as well as we did and had so little difficulty afterwards. Much credit for the cleaning up work in those days must be given to the owner who feared tuberculosis as the devil fears holy water. As this happened almost directly after the herd at the State College had been wiped out by the disease in 1886 and a joint committee of the legislature had investigated the matter in 1887, the subject was in everybody's mouth. In 1891 tuberculin was discovered and almost at once discarded as a cure and taken up as a diagnostic agent, adopted by the then cattle commission, and was used constantly from that day to this.

I have quoted the above simply to show that small doses as used at that time were very efficient. We had no means of checking up with the opthalmic or intradermal tests. We checked up by what we found the next year, and by that standard we left few if any diseased animals behind.

There are herds today where tuberculosis is persisting that have been subjected to the test many times. Whether this is from too frequent testing or too large dosage is yet to be proven; but the fact remains that some eminent veterinarians are taking the stand that if tuberculosis is not eradicated from a herd by the first two or three tests that it is going to be an almost impossible job to get rid of it. By the use of the opthalmic and intradermal tests we have opened up a new avenue of information, or possibly a new source of misinformation, according to the manner of carrying out the procedure.

From many years of experience I am inclined to think that the man is half of the test. Thoroughness, thoughtfulness, carefulness, painstaking, not shirking the necessary time, over-particular rather than not particular enough, but not so fussy as to make everybody sick and tired of you, are good procedures. Possibly, as a man grows older, he is apt to shake his head, and think that things are not as they used to be.

Parasitic Diseases of Domestic Fowls

By H. B. RAFFENSPERGER

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THE subject of internal parasites in animals and fowls is receiving more attention as we learn more of their harmful effects on the host. The character and extent of injury to the host in many infestations of the more common parasites have not fully been determined. The symbiotic relation of parasites in a host must be given more attention if we are to determine to a fuller extent the harmful effects on the host.

The work of Theobald Smith and H. W. Graybill on "Infectious Entero-Hepatitis or Blackhead" in turkeys surely will stimulate those in the field of investigation to greater activities in associating parasites with secondary infections, or rather to look upon certain parasites in the hosts as preparing the way for the invasion of other diseases.

Experiments in Transmitting Blackhead.

Smith and Graybill (Journal of Experimental Medicine, May, 1920,) found, by making numerous feeding experiments, that feeding the droppings from infested turkeys containing the protozoan parasite, amoeba meleagridis, to young turkeys free from internal parasites, raised in an incubator, would not infect the young turkeys; but that if the droppings from infested turkeys were fed with embryonated eggs of Heterakis vesicularis (H. Papillosa) to young turkeys, the condition known as "blackhead" could be produced. The work done by these two investigators indicates that Heterakis vesicularis probably prepares the way in the ceca for the entrance of the protozoan parasite. Whether Heterakis alone or its association with some other accessory agent is responsible for preparing the way for the invasion of the walls of the ceca and liver of the protozoa has not been established. However, the knowledge gained from the work of these investigators on "blackhead" in turkeys points out the way for the control of this malady. Without a doubt more light may be thrown on the subject by future investigations, but since the embryonated Heterakis eggs apparently play a part in transmitting the disease, sanitation with reference to parasites becomes a very important factor in the control of "blackhead," which is so disastrous to our strictly American Thanksgiving turkey.

Another very common parasitic disease in fowls, in certain localities, is syngamosis, or tracheal strongylosis. There are two species that invade the trachea and bronchi of fowls: Syngamus trachealis in chickens and turkeys, and syngamus bronchialis in ducks. The disease is commonly called gapes from the common symptom of gaping produced in young chickens.

Dr. B. H. Ransom, chief of the Zoological Division of the Bureau of Animal Industry, has presented a note on work done in syngamosis, at a meeting of the Helminthological Society of Washington. His investigations showed that young chickens were readily infected by feeding infectious material, while old chickens were not readily infected, and if they became infected at all the parasites rarely developed to maturity; if they did, they remained in the trachea only a short time. On the other hand, turkeys are susceptible at all ages, adult turkeys as well as young ones being readily infected, and continuing to harbor the parasites over long periods. You can readily see that adult chickens would thus rarely be carriers or spreaders of the infection, while adult turkeys would frequently be carriers. Of 635 adult chickens examined for gape worms at Washington, D. C., all were negative. Of 679 adult turkeys examined at the same time, 153 showed gape worms. His investigation would indicate that turkeys are carriers of these parasites, and certainly should not be permitted to flock with small chickens.

Dr. Ransom's investigations have also confirmed the work of other investigators that an intermediate host is not necessary in the cycle of gapes; that the eggs sneezed and coughed out, or coughed up, swallowed, and passed in the droppings, as well as the adult worms coughed out, are distributed over damp soil, where the eggs develop to the infective stage, and are picked up by the young chickens, which become infected. The eggs are being constantly produced and oviposited by the gravid females through the natural opening of the vulva. This process was thought at one time not possible, as the male is usually attached to the female, giving the parasite a forked appearance. The attachment of the male to the female by the bursa was

*Read before the University of Illinois Veterinary Conference held January 26-28, 1921.

thought to prevent the passage of the eggs, and for this reason the opinion prevailed that the eggs escaped from the females only by rupture of the uterus and worm. Railliet and others investigating ovulation of the gapeworm found that the eggs pass from the female through the vulva from under the bursa of the male. Some of the eggs contain a well-developed vermiform embryo when coughed out or passed in the droppings.

Nematodes of the Alimentary Tract.

Of the nematodes that infest the alimentary tract of fowls there are two species that may be specially referred to because of their frequent occurrence: viz., Ascaridia perspicillum (Heterakis perspicillum) and Heterakis vesicularis. The former is found in the small intestines, and the latter (already mentioned in connection with blackhead) usually in the ceca. Both species are common in young fowls, and, without a doubt, do considerable harm to the host under certain conditions.

The embryo of Ascaridia perspicillum may be developed at various temperatures. I have placed eggs in a 1 or 2 percent formaldehyde solution, and held them at a temperature of 22 to 24 degrees C., and in 12 to 15 days found active vermiform embryos. They will probably develop sooner at a little higher temperature.

If the eggs containing the active vermiform embryos are fed to young chickens they get an infection in the small intestines. Ten days after feeding embryonated eggs I have found the larvae in the small intestines measuring 460 to 492 micromillimeters in length. I also made a careful examination of the lungs to ascertain if any larvae were present, but found none. However, we should not state positively that the eggs in the infective stage, taken in by the host, develop into fully grown ascardia in the intestines, as we know that eggs containing vermiform embryos of the toxascaris limbata, ascaris suum and others do not develop to adults in the intestines when first taken in, but migrate to the lungs through the blood stream, pass through certain stages of development, are coughed up, swallowed, and then develop to adults in the intestines. There may or may not be a lung stage in the cycle of Ascaridia perspicillum.

The fact that Heterakis vesicularis apparently plays such an important role in "blackhead" infection makes it, in consequence, an important parasite.

There are several varieties of filarid and spirurid worms which are found on serous membranes and in the gizzard, which can not be discussed within the limits of this paper.

Other parasites which may be properly referred to in this paper are cestodes or tape worms, of which there are probably 28 to 30 known species in different kinds of poultry. The ones that are most frequently found in chickens are choanotaenia infundibuliformis, Hymenolopis carioca, and tape worms of the genus Davainea, of which there are four common species in chickens, three of which are known in this country, and two of which, Davainea tetragona and Davainea cesticillus, are quite common. Choanotaenia infundibuliformis and Hymenolopis carioca are also quite common.

Dr. V. A. Moore in 1895 spoke of nodular taeniasis, caused by the presence of a tape worm identified by Stiles as Davainea tetragona, but afterwards found by Ransom to be Davainea echinobothrida. This parasite has hooks around the suckers in addition to the armed rostellum, and with its armed head can penetrate the intestinal mucosa, causing the formation of nodules.

The cycles of only a few of the tape worms of fowls are known. The common house fly is the intermediate host of the Choanotaenia infundibuliformis. It is also thought that this fly is the intermediate host of Davainea cesticillus, but this fact has not been fully established.

Guberlet of the Oklahoma Agricultural Experiment Station, believes that the stable fly serves as an intermediate host for the Hymenolopis carioca, and acts as the agent of transmission.

Prevention and Treatment.

In the control of intestinal round worms and tracheal parasites, prevention by sanitation must play an important part.

A treatment which has been recommended by the Oklahoma Experiment Station for tape worms and round worms in chickens is as follows: A gallon of a mixture of wheat and oats, to which is added a small tablespoonful of lye, is cooked slowly for about 2 hours and allowed to cool. The birds are fasted for about 15 hours, and then given as much of the mixture as they will eat, with plenty of water. Tobacco is also recommended, using one-half teaspoonful to each bird. The tobacco is finely chopped and mixed with feed, and cooked for 1 hour. The birds are fasted for 15 to 20 hours before giving the mixture.

The eradication of tape worms is a more difficult problem, as insects and other invertebrates serve as intermediate hosts, and the problem of control is, therefore, more difficult.

Pain and Its Relation to Vivisection

By PHILIP BROWN
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IT IS but natural that the veterinary profession should give utterance to the abused and faulty interpreted question of vivisection.

What is vivisection? Literally, of course, the cutting of a living thing, such as opening an oyster, crimping a cod or foxing a terrier. Vaguely explained it is the cutting into any living being for scientific purposes. But this sort of thing is not what people mean when they speak of vivisection. The average person refers to it as any experiment upon animals which gives them pain; they generally have some loose ideas about dissecting alive and the more careless of them throw in torture as a natural accomplishment without waiting to inquire into the degree of pain caused.

Secondarily, it is right for one creature to suffer for the good of another, and have we the right to constitute ourselves administrators of this law and to apply it to animals for our own interest? The answer is that nature will do so in the interest of the race if we let her alone, but when we domesticate any creature we protect it from her action to a certain extent. It is generally admitted that we may chase and kill an animal, often necessarily with much pain, not because its life and liberties interfere with ours but because its death will render our life more complete. We kill them without anesthetics not only that we may have food and clothing but that the food may be varied and attractive and the clothing rich and beautiful. We imprison them in cages to improve our knowledge of natural history or merely to amuse ourselves by looking at them. Hence it is clear that in all our customary dealing with animals we apply to them without scruple the law of sacrifice and interpret it with a wide latitude in our favor.

People talk about the rights of animals and impart into the discussion the very feeling of personal outrage and wrong which they themselves would have if any of their own were invaded. But the sense of individual rights is not even human, for, according to Spencer's "Principles of Sociology," page 583, how much of it can a Fijian have who stands still to be knocked on the head because the king has willed it, or a Dahomean who belongs to a nation which every man is the king's slave. Probably the Fijian does not like to be knocked on the head any more than the ox does, but it is absurd to assume in beast a sense of injury which is absent in man.

Knowledge of Pain Derived from Human Experience.

Now the question arises: what is pain? All that we know about pain is derived from human experience. This seems very obvious, but nevertheless it is often forgotten. As a matter of fact we know nothing about pain except what we have suffered ourselves. We cannot feel with another person's nerves.

We know that there are two main classes of nerves, viz., the afferent and efferent, or sensory and motor, and a description of physiological functions relative to pain is unnecessary here. But it should be emphasized that pain is dependent on the condition in which the stimulation finds the brain and upon the mental element. The organ may be awake and ready to attend to it and in that case there will be a keen feeling of pain; then if the stimulus has not been of quite so strong a kind there will be a faint impression made on the mind and soon forgotten, or it may be stupified by narcotics. But whatever the degree of pain felt, the jerking away of the part which is the outward sign of pain, will be present all the same.

It is known if we decapitate a frog and pour acid on one limb he will rub the irritated part with the other limb. So long as only the higher centers are laid asleep, reflex actions will go on even more markedly with greater energy than when it is awake.

People operated upon under chloroform may shrink and scream because the stimulus from the irritated nerve has gone around to a nerve center which reflexly set the vocal organs in motion, but their intellectual higher sensory centers are asleep and they feel nothing. It will not do to say that they did feel the pain at the time but have forgotten it, for justly they will sometimes remember having heard themselves scream. If so, why should they not remember the much stronger impression of pain?

Thus it is only reasonable to conclude that even cries do not prove that pain is really felt, because they do not prove that the brain is

in a condition to realize it. It is the same with motions, jerks and struggles.

It is said a horse can kick after he is dead. The English knacker after he has cut off the horse's head will pass a long rod down the spinal marrow to destroy its activity; otherwise as soon as he would begin to skin the body the legs might kick with sufficient force to break an arm or leg.

Pain, like many other words, is used with ambiguity. A moderate stimulation of a nerve produces a useful or agreeable effect. Nerves were meant to work, and for each there is a degree of activity which is normal and pleasant. Beyond this point stimulation becomes distressing and injurious, and when sensory nerves are involved passes into pain. Pain may therefore be described as the result of excessive stimulation of a sensory nerve.

Of course, we must be conscious at the time and the result is feeling. The capability on the part of a nerve of being affected by stimuli is called irritability; it lies quite apart from consciousness and is entirely different from feeling. The heart taken from the decapitated frog has irritability because it can continue to beat under a current of electricity, but there is no brain and so can have no consciousness and no feeling. If instead of removing the cerebral hemispheres we suspend their action by narcotics the effect for the time being is as if they were not there, and there may be the highest irritability of the nerves but still no feeling in the creature. We are on firm ground because we are going on human experience assisted by trustworthy analogy.

The Higher the Development of the Brain, the Greater the Degree of Pain Felt.

As the existence of feeling depends on the activity of the brain there is a fair presumption beforehand that it also increases with the more perfect development of that organ. This seems so obvious as to be hardly worth mentioning, yet it is ignored by those who argue from our feeling to those of the lower creatures, as if they were the same, and assert that animals are as sensitive as man.

Particular stress should be laid on this point, namely, that the reactions of animals may be as prompt as those of men because a larger proportion of their nervous energy works through the spinal cord and lower brain centers.

The question is not. Does a prick of a needle make them start as quickly as a man would? But what impression does this needle prick make on their consciousness? And the answer must depend upon the amount of nervous energy which goes to vivify that consciousness. The very fact that man's intellectual activity is so much greater shows that a larger surplus vitalizes his brain and proves that the whole stock of nervous energy from which that surplus is taken must be larger than that of inferior creatures. Therefore, though an animal's nerves may display as much irritability as man's, it is improbable that it can have as much feeling as he has; moreover we see that in human beings reflex actions are most marked where there is no intellectual action, i. e., when asleep, narcotized, or have sustained injury of the brain.

Such intellectual creatures as dogs have, of course, memory, and are capable of recalling places and things which have been associated with suffering or dislike, but with the average dog such memory is faint as compared with what we would exert under similar circumstances.

A dog released from an experiment has been known to jump upon the operating table and sit up there to inspect with interest his companion having his turn, showing that no very painful impression could have been left on his mind by whatever disagreeableness he had undergone.

A house dog met with an accident by which a large piece of skin and flesh above the eyebrow was cut out and hung loose over the eye. His master, a surgeon who furnished the anecdote, determined to stitch it. The dog was muzzled and the cut stitched. During the time it was being done he was striving and struggling to get away, although never wincing or crying. The instant he was released he dashed away and seized a bone which he had his eye upon while he was being operated on without any anesthetic and proceeded to enjoy it.

An accident is recalled of a horse whose leg was badly broken and which was to be shot, but there was some delay before the execution. There was a compound fracture . Needless to say, the least motion would cause a human patient suffering from the same condition, most excruciating agony. During the delay, however, the horse grazed and limped about, carrying the fractured limb dangling.

Such cases as these leave it no longer to conjecture whether animals feel as keenly as human beings. We have demonstrated that the reactions in the former commonly called

signs of pain prove only irritability and not feeling.

We are all agreed that cruelty is wrong. Well, what is cruelty? The simplest thorough definition seems to be the wanton or excessive infliction of pain. The wanton infliction of pain is that for which there is no justification in fact but not in degree. We will endeavor to ascertain what it is.

We are constantly thrown back for the test of the justifiable infliction of pain upon a certain proportion existing between the evil of suffering caused and the benefit of whatever kind to be obtained. Any one who hurts another sentient creature without intending to obtain a good, greater than the harm that he does is insofar cruel.

No doubt we all agree that experimentation, especially when acompanied by vivisection, should be done by properly qualified persons and only by those who have due appreciation of their responsibilities in such undertakings. The comfort of the animals used should be considered. No attempt is here made to defend experiments which have not these distinct aims in view.

Some agitating fanatics put forward without apparent reason or purpose that all animal experimentation is cruel, detestable and immoral because of unscrupulous misrepresentations and advocate its complete abolition. The writer for one, always has a warm spot in his heart for our veterinary patients, but no misplaced affection is held for dumb beasts in surgery. We must not allow our sympathy to over-ride us when the means will justify the end.

Experimentation Means Progress.

The age of experimentation is the age of progress and medicine is no exception. While animals have benefited greatly from experimental research the chief object has been to benefit the human race. We must remember that the least deviation from the usual practice by using a new drug or even a larger or smaller dose of an old drug in a different way, is an experiment. Clinical observation is constantly urged by the anti-vivisectionists as the best and proper method of progress.

This method of progress should not be devried, but the moment the practitioner acts on his own clinical observations of any new method, dose or new drug, or slightly varied or new operation, he is making an experiment, acting only in the capacity of veterinarian or physician. No one has any right to try a method far departed from common procedure upon a human being or valuable animal first if it is possible to test it on an inferior animal first.

What Vivisection Has Accomplished for Humanity.

Data showing what achievements vivisection has gained for human beings and animals were submitted to the writer by S. Dana Hubbard, acting director of the Bureau of Public Health Education, and the following statements were selected from amony numerous others:

(1) In seven years of experiments on animals more was done for alleviating human misery from ravages of syphilis than clinical observation has done in over four centuries.

(2) The modern wonders of surgery are largely the results of animal experimentation.

(3) Tetanus has been almost entirely abolished.

(4) Reduced the death rate in open fractures from 66 in 100 fatalities to less than 1 in 100.

(5) Abolished yellow fever and through this effect made possible the Panama Canal. In this instance human volunteers had to be used and Dr. Lazaar sacrificed his life.

(6) Reduced prevalence of rabies.

(7) Cut the death rate in diphtheria.

(8) Formerly, no matter how briiliant the operation or operator, sepsis and gangrene were found very frequently to occur.

(9) Made operation of goitre possible.

(10) Koch's discovery of the tubercle bacillus is the cornerstone of all our modern sanitary achievements.

(11) Typhoid vaccine largely abolished typhoid fever from the armies of the world.

(12) We ultimately hope to discover the cause of cancer.

Do you think such process should be hampered? Animal experimentation has greatly benefited animals by discovery of the causes and in many cases the means of prevention and in some a positive cure of certain diseases. Conspicuous among these are tuberculosis, rinderpest, anthrax, glanders, hog cholera, chicken cholera, actinomycosis and other communicable diseases.

When science has progressed through this aid, who would dare stay the hands of men who are trying to lift the curse of disease from the whole race not only of mankind but of animals as well.

If the extreme "anti" cannot be reconciled, why does he or she not give heed to infliction of pain in the slaughter of animals for food, that inflicted by the hunter when the victims of his sport or needs are imperfectly shot, or to that

which women allow in order to have fine feathers and furs upon their backs?

Before these same people annually petition our lawmakers to restrict vivisection they should first give heed to the aforementioned facts, and perhaps it would bother their own consciences.

In conclusion the writer would like to make it clear that his views are that unnecessary and needless vivisection by inexperienced and improper individuals should be stopped. All vivisection should be accompanied by every possible precaution to prevent suffering of all kinds. That unrestricted performance by proper persons of scientific experiments upon living animals is essential to the maintenance of progress of medicine and its allied science, biology. Lastly, those that persist in their war against scientific experiments without the modifications that have been elicited are making an effort to keep many instead of few animals in suffering, men instead of beasts, and the most sensitive creature instead of the least sensitive; whereas a true humane endeavor seeks to prevent as much as possible of human suffering at the cost of as little as possible of animal suffering.

On which side is the cruelty?

Efficiency of the Milk Cow as Food

In an official report on the food supply of the United Kingdom it is estimated that to produce 100 calories of human food in the form of milk from a good cow required animal food of 2.9 pounds starch equivalent; 100 calories of milk from a poor cow is estimated to require the consumption of 4.7 pounds; while to produce 100 calories of beef from a steer 2½ years old it is estimated that 9 pounds of starch equivalent in feed are required.

Stated in terms comparable with those used by Dr. Armsby, this would mean that the good milk cow returns 20 percent of the energy value of what she consumes, the poor milk cow 12 percent, and the good beef steer only 6 percent. Although this estimate is more favorable to the beef steer than is that of Dr. Armsby, yet even in this estimate it will be seen that the poor cow is twice as efficient and the good milk cow more than three times as efficient as the beef steer in the conservation of energy in the food supply.

Considering the whole length of life of the animal, Prof. Wood, the leading English agricultural expert, estimates that the cow returns in milk, veal, and beef one-twelfth as much food as she has consumed, while the beef steer returns only one sixty-fourth. In other words, the cow is five times as efficient as the beef steer as a food producer when the whole life cycle of the animal is considered. Similarly it has been estimated by Cooper and Spillman * that the crops grown on a given area may be expected to yield from four to five times as much protein and energy for human consumption when fed to dairy cows as when used for beef production. As Wood has very strikingly shown, the longer the time that the beef animals are fattened on grain the less economical the process becomes.

Quite recently Dr. Armsby has pointed out that "the dairy cow shows the highest efficiency of any domestic animal, both as regards conversion of food and availability of the product for man."

Not only is the milk cow several times more efficient than the beef steer in the conservation of proteins, fats, and carbohydrates for human consumption, but in the gathering and preparation of mineral elements and vitamines she contrasts even more favorably with the beef animal. It is largely because of its richness in calcium and in fat-soluble vitamine that milk is the most efficient nutritional supplement to bread or other grain products.

Meat is strikingly poor in calcium and does relatively little to balance a diet consisting largely of bread or of other products of seeds. It does, of course, supplement the protein, but American dietaries would nearly always be adequate as regards protein even without the meat that they contain. On the other hand, dietaries containing little or no milk are very apt to be inadequate as regards calcium. Detailed analysis of the results of hundreds of American dietary studies shows that in practice the adequacy of the calcium intake depends more largely on the sufficiency of milk supply than upon any other factor.

The vitamines furnished by hay and grains, and thus consumed by cattle, are stored in the animals' tissues to only a limited extent, but they are transferred in relative abundance to the milk. Hence the vitamines of the coarse material of grain not directly available as human food are brought into form for man's use very efficiently through milk production and very inefficiently through the production of meat.

Thus, the results of recent studies in nutrition, which have made clearer the importance of the mineral elements and vitamines, is to emphasize strongly the great desirability of a more abundant milk supply, even if this should somewhat

reduce the production and consumption of meat. Our present knowledge of nutrition justifies more fully than ever before the statement that "the dietary should be built around bread and milk," bread or other grain products being the foods which furnish the most nutriment for their cost (whether in money or in land and labor), and milk being by far the most efficient nutritional supplement to bread or other grain products. Therefore, somewhat more of our grain crops than is the case at present should come directly into human consumption to augment the bread supply; and of the grain fed to cattle more should be used for the production of milk and less for the production of meat.

In general, 10 pounds of grain may be expected to produce not over 1 pound of meat or about 3 quarts of milk. If the 3 quarts of milk cost the consumer more (because of greater labor cost in production), they are also certainly worth more to him. Insofar as things as different in their nutritional properties as meat and milk can be compared, it is fair to say that I quart of milk is at least as great an asset in the family dietary as is 1 pound of meat. The per capita consumption of meat in the United States is so high that it might be reduced by one-third or even one-half with little or no nutritional loss, while a corresponding increase in milk consumption would certainly constitute a great improvement in the average American dietary. We are confident that a moderate shifting of emphasis from meat to milk will help in the normal evolution in the diet in the conservation of proteins, fats and carboyhydates, and in the gathering and preparation of mineral elements and vitamines.

The following is contained in the report of the committee: It has long been known, but perhaps never sufficiently emphasized, that the milk cow returns in the human food which she yields a much larger share of the protein and energy of the food she consumes than does the beef animal. Dr. Armsby, probably the leading expert of this country on animal nutrition, has estimated that of the energy of grain used in feeding the animal there is recovered for human consumption about 18 percent in milk and only about 3½ percent in beef.—Public Health Reports (U.S.) 35 (1920) No. 17, pp. 994-996.

Scene in the Mountain Parks Near Denver, Where the A. V. M. A. Convention Will Be Held.

President White of the A. V. M. A. says that instead of waiting for members to ask him about convention arrangements, he is going to do the "carry the message to Garcia" act and beat them to it. The proposed program promises so much that is both unusual and worth while that he feels sure, in point of attendance, this convention will reach the outermost goal post.

Anticipating a hot summer, Denver should be the finest place on the continent to be in at the time of the convention. After adjournment the members, together with their families and friends, will have "the time of their lives" seeing the wonders of the "Centennial State," while some are getting their exhausted vitality coaxed back and others are having their rusting frames oiled, tightened up and set a-going.

He proposes to have the convention start when the members leave Chicago, and to the end that they may gain the advantage of freely fraternizing en route, nothing short of a special train will do. Further, he has requested the management of the Burlington railroad to operate such a train on a schedule which a canvas indicated will be the most desirable and accommodating to members.

He pledges himself to see to it that full and detailed information concerning time of departure, cost of railroad and sleeping car accommodations and other desirable arrangements is given to the members.

The place is Denver, Colo., and the time is Sept. 5-9.

Abstracts of Foreign Literature

Edited by A. EICHHORN, D. V. S.

Cystic Ovaries in Mares.

Kirst Hellmich. (Inaug. Diss. 1920.)

Cystic ovaries in mares are of frequent occurrence. As a rule they appear multiple and bilateral, and may be found in mares of all ages, even in young individuals which have not as yet attained their sexual maturity.

The cysts represent mostly spherical bodies, which are filled with fluid to their full capacity, and which are provided with their own cystic wall. The microscopical appearance of the contents of the cysts varies; it usually represents a watery clear pale yellow fluid. At times, however, a yellow or brownish fluid may be found in the cysts; a distinct hemorrhagic condition of the cystic contents has been observed in some cases.

The age of the mares has no influence on the size of the cysts; those of the size of a walnut or a hen's egg are less frequent than those of the size of cherries.

The small cysts are more or less embedded in the deeper parts of the parenchyma of the ovaries, so much so that the superficial examination does not disclose the cystic formation, and they become manifested only after the organ is cut. In a series of cases the surface of the ovaries discloses more or less pronounced round protruberances; on palpation the cysts may be felt embedded in the parenchyma, which are in sizes up to a hazel nut. Such cysts, together with the surrounding parenchyma, protrude over the surface of the ovaries. Ordinarily, however, the cysts as soon as they attain the size of a cherry protrude more or less over the surface of the ovaries. In many cases there are so many cysts of hazel-nut or cherry size and they lie so close to each other that the surface of the ovary has the appearance of a bunch of grapes. Walnut or egg-size cysts lie, as a rule, even more on the periphery, so that the largest part of such cysts protrude over the surface of the ovaries.

Efforts to crush the cysts ante-mortem succeeded only very rarely. The supposition that besides the cystic formation there is usually an affection of the uterus and that the former is probably the sequel of the latter, similar to this condition as it occurs in cows, has not been confirmed. Out of 115 mares with cystic ovaries only 30 showed changes in the mucous membrane of the uterus. In the mares, therefore, uterine affections and ovarion cysts are not simultaneously present as frequently as in cows.

Cystic ovaries occur also in mares coming regularly in heat, and also in pregnant mares; therefore the cystic formation in a mare is no criterion for an affection of the ovaries which produce a disturbance in the normal functioning of these organs.

The Bang Bacillus and the Uterine Affections in Cattle.

Prof. Rivabella. (La Clinica Vet. 1920, No. 13-14.)

In order to establish the relation between the Bang bacillus and the various uterine affections and also the relation of sterility to abortion, "the two scourges of the breeding industry," the author undertook investigations on 100 cows in such a manner that he subjected the uterine secretion of all animals to a rigid microscopical examination, and also subjected the blood of these animals to the agglutination test. For his investigations he utilized animals from the local abattoir, in which, aside from the above examinations on the living animals, a careful examination of the genital apparatus could be undertaken post mortem; also animals on farms in which the clinical examination revealed the most varied kind of uterine affections and in which sterility or abortion has been established. As a result of his investigations the author concludes that in spite of the very frequent infection with the Bang bacillus this organism is only in a relatively few cases the cause of sterility and abortion, and that these conditions at least in that locality are more often the direct result of the extraordinary frequent uterine affections.

The Action of Normal Serum in Anthrax Infections.

Dr. Gerlach. (Cent. f. Bakt. 1920, Vol. 84, No. 5.)

The claims of Kraus and Beltrani that normal sera exert the same action as anthrax immune sera could not be confirmed by Hutyra and Mar

ninger. In their work they failed to produce an immunity with normal sera. Gerlack also could not produce any immunizing action with normal sera in rabbits. The test animals succumbed regularly to the subsequent infective inoculation. Likewise, the sera of rabbits which after treatment with anthrax serum resisted the infection with virulent material, had no protective properties. Therefore the contention of Hutyra and Manninger that Kraus and Beltrani had in all probability used normal sera from animals which have spontaneously recovered from anthrax cannot be accepted.

Intensifying the Action of Cocaine by Adding Potassium Sulphate.

Dr. E. Peters. (D. T. W. 1921, No. 1).

The lowest dilution of a cocaine solution which can be used for anesthetizing purposes on subcutaneous injections is 0.05 percent. In this strength it produces either no anesthesia or it lasts only from 5 to 20 minutes. It requires at least a 2 percent solution to produce anesthesia of the conjunctival or nasal mucous membrane.

The addition of potassium sulphate to the cocaine solution affects for subcutaneous application an increased action to such an extent that 0.05 percent cocaine and potassium sulphate solution produces an anesthesia which lasts from 1 hour and 40 minutes up to 4 hours. The addition of potassium sulphate to the cocaine solution does not increase the action of this product, for anesthesia of the conjunctival and nasal mucous membrane. The combined solutions have no irritating effect on the tissues, but they must be prepared freshly before the injection. Adrenalin can be added only to the injecting solution immediately before the injection.

The Relation of Anthrax Septicemia to Lactation.

Dr. E. Vogt. (Berl. Kiln. Woch. 1919, p. 703).

During slaughter of a cow infected with anthrax a woman sustained a cut on the left ring finger which resulted in an infection associated with anthrax septicemia and multiple metastatic abscesses. A local affection of the breast did not develop. The patient recovered. The disease had no effect on the lactation and had no ill results on the suckling infant.

A Case of Acute Glanders in Man.

G. Herzog. (Munch. med. Woch. 1919, p. 157).

The patient sustained an injury from the claw of a tiger skin during the process of curing the same. It is probable that the tiger died of glanders after the ingestion of glanders meat. The skin, however, was already salted, and dried and again softened during the process of curing. Therefore it appears that the glanders bacilli must have remained active on the skin for a very long time.

Further Experimental Investigations on the Active Immunization Against Glanders.

A. Marscr. Zeitschr. f. Immunit., Vol. 28, p. 410).

The author again describes cases which indicate that it is possible to immunize horses against glanders with glanders bacilli killed with glycerin (Farase), whereas bacilli killed with ammonia or trikresol do not exert an immunizing action. The serological reactions appear at irregular times after the injection of the killed glanders bacilli, and likewise there is a marked difference in the persistence of the reactions in different animals. The ophthalmic reactions remain always negative. A positive ophthalmic reaction indicates that the animal must have been in contact with living glanders bacilli. In carrying out the eye test it is advisable to use the second eye as a control, into which a thickened bouillon is installed which in its consistency corresponds with the mallein.

Even after an injection of virulent culture the various diagnostic reactions gave positive results at varying times following the infections. It is therefore indicated to utilize several methods for the diagnosis of glanders, the ophthalmic and the complement fixation test are being especially recommended.

The Transmission of Scabies from the Horse to Man.

Dr. Engelberting. (D. T. W. No. 43, 1920).

The transmission of scabies from the horse to man occurs more frequently than is generally accepted. It occurs during accidental contact or during grooming and handling of the horses. The susceptibility of the individual varies and depends principally on the tenderness of the skin and to what extent it is covered with hair. The period of incubation is from 18 hours up to a few days. The usual place of predilection of the true scabies of man (hand, carpal joint, shoulder folds) are not affected by scabies from horses; the affection usually commences on the middle of the lower arm; the head and face are rarely affected. As a rule the affection is benign, and recovery takes place in from two to eight weeks. More severe cases which may result in complications yield only to persistent medication.

Veterinary Surgery

Edited by L. A. MERILLAT, V. S.

Country Practice Contrasted with City Practice

THE city practitioner, no matter how capable, who might be suddenly thrown into a mixed country practice, would find to his surprise and discomfiture that his work had not required him to accumulate as broad and diversified a knowledge of veterinary science as his country conferee. He would find that his field of work and observation had been very limited indeed.

The city veterinarian, figuratively speaking, can count the diseases he treats on the ten fingers of his hands, while the country brother would need all the hairs of his head to count them. The one treats horses and dogs, and the other all of the domestic species. The one chiefly treats mature animals, usually of middle age and under care and management that is fairly uniform, while the other meets all ages, housed, handled and fed under a variety of conditions too numerous to mention. To the one the diseases of the generative tract, of pregnancy, of parturition and of the young animal are things but vaguely recalled as having been heard in the lecture room, while to the other these are problems of great moment included in the daily grind and demanding a wealth of detailed knowledge, experience and skill.

The Country Practitioner.

In the large cities there are no scourges of great concern to the live-stock industry, while any day in the country an incompetent veterinarian might overlook a contagious disease that is capable of creating havoc in the community and even become a national calamity. Parasitism, so important to the live-stock interests, does not worry the urbanist, while, on the other hand, it continually puts the ruralist to the supreme test.

In surgery the contrast is quite as striking. Castrations of all the different species, hernias, cryptorchidism, obstetrics, impotence, sterility, mammary and teat affections, navel ill, deformations of the young, shoulder injuries of the young work horse, shoulder slip, bloat and impactions of ruminants, traumatic indigestion, wire cuts, fistula of the withers, poll evil, aberations of the deciduous dentition, etc., are by no means all of the many conditions which with few exceptions do not concern the city practitioner. His country brother, however, who could not acquit himself skilfully in handling all of these would be a pronounced failure. And to this must be added the ability to properly restrain for surgery all the different species of all sizes and ages. The skilful handling of everything from a suckling pig to a monstrous stallion or dangerous bull is no trivial accomplishment, and yet most country practitioners do just these things every day without a hesitating movement.

Feeds and Feeding.

It is, however, in the matter of food hygiene that the greatest differences are met. The city horse is fed upon an inspected grain and hay ration. For the most part the feed consists of oats, timothy or prairie hay and water. Corn and commercial mixtures are sometimes substituted when oats is thought to be too high in price. It is thus apparent that feeding the city horse is a simple matter. Note the difference in the rural districts. There is the blue grass pasture, the red clover and alsike pasture, the alfalfa pasture and the stalk field, any of which may run into low-lying slough lands, and in many instances there are brush and weed which if not actually poisonous are very frequently harmful.

In the city the water supply is always wholesome and of a temperature that varies but little, and that gradual. In the country the water is too warm in summer and entirely too cold in winter, where especial provisions are not made to correct this evil; not infrequently it is none too plentiful.

In the matter of roughage the country animal eats the hay that would not grade high enough to sell on the hay market, shredded corn stover that is often mouldy, weedy oats straw and woody grades of alfalfa that has been badly cured. Corn on the cob is often mouldy, and

oats light and chaffy. Corn and cob meal or mixed chop feeds ground at the custom mill or at the farm are often found heated on account of immediate storage in too large a bulk, and bran, middlings, oil meals, and other purchased feeds are often allowed to spoil on account of poor storage accommodations. This variety of harmful influences to live-stock, all of which tax the wits of the country veterinarian, are not found in a purely city practice.

Country Practitioner's Cases.

The following is a list of consecutive cases treated in a country practice:

(1) Stricture of Teat.—In a grade Durham cow that was difficult to diagnose, although the quarter was full of milk only a few drops could be milked out. After careful palpation of the meaty udder a small hard nodule was found at the base of the teat the size of a grain of wheat, but nevertheless big enough to cause almost total obstruction. The teat syphon could not be passed into the sinus. The owner was advised to allow the quarter to dry up rather than to invite complications in the attempts to open the duct by instrumentation or excision of the nodule.

(2) Traumatic Hip Lameness.—A two-year-old colt slipped and fell hard on a slippery incline on being turned into the barn yard from the stable. On rising it could not use the left hind leg, and perspired for some hours from the excruciating pain. There was no swelling nor pain on palpation that would enable one to locate the exact seat of the injury, and although the cause and the distress indicated fracture none could be located. No skeletal deformity developed and recovery was slow. The lameness remained acute for two weeks and lasted three months. The recovery was complete.

(3) Retained Placenta.—This case involved a grade Guernsey primapara. The calf was small but viable. Inquiry into the history of the small herd of five cows showed that abortion disease was responsible for this and other similar casualties preceding. Although the owner expected the after-birth to be removed forthwith he was persuaded to allow it to be handled according to the recommendation of DeVine; that is, flushing with saline solution until all the parts loosened and washed out. The cow was isolated in a box stall of the horse stable and advice given as to the future management of the herd.

(4) Castration of Two Pigs.—They were affected with scrotal hernia. Incisions were made over the internal inguinal ring, the cord tied off, and the pigs castrated through scrotal incision.

(5) Congenital Perforation of Teat.—In a pure-bred Guernsey cow, fresh for the second time, the perforation was located 1 inch from the tip of the teat. The trouble was very annoying because in milking as much milk would flow from this abnormal meatus as from the normal one at the end, and would thus keep the milker's hand soaked. The cow was cast by the "maison rustic" method, stretched out as recommended by Furgeson, and the abnormal channel dissected out. The wound was closed with a single crucial suture and covered with adhesive tape. The milk was drawn with a teat syphon and the teat allowed to dry up during the existing milking period.

(6) Sick Milking Goat.—The only symptom was anorexia. No form of physical examination would give a vestige of a clew to the nature of the trouble, and despite treatment it died after about a week of illness. The autopsy was quite as perplexing as the ante-mortem examination.

(7) Bilateral Gonitis.—This was in a suckling pure-bred Percheron colt. Both stifles had bulging capsules and there was a marked lameness in one of them. The general health was not much impaired and the condition of flesh was good. The colt was weaned at seven months, still slightly lame, and some enlargement remained in the capsular ligament. The treatment consisted of the application of stimulating liniments to the affected joints and tonic treatment and proper hygiene for the mother.

(8) Virgin Case of Fistulous Withers.—Both sides of the withers were badly bulged with a non-painful fluctuating enlargement which contained amber-colored fluid and flocculant bodies. Radical operation was performed through a median line incision and 6 inches of the ligament removed. There was no lateral drainage. The wound healed after three months of rather indifferent care on the part of the owner.

(9) Caponizing Forty Cockerels Four Months Old.—There were no casualties except to slips, and one case of subcutaneous emphysema which yielded to setoning.

(10) A Difficult Parturition in a Holstein Heifer.—The presentation was normal, but the calf was exceptionally large and impossible of self-delivery. The handling consisted of a little patient traction, with ropes attached to the fore pasterns.

(11) Emaciation and Diarrhea.—This was a case of a steer in the feed lot recently imported from the West, and suffering from a sub-acute emaciation and diarrhea. A diagnosis of Johne's

disease (without confirmation) was made. The steer died two days after the examination and was sent to the rendering tank without a post-mortem examination.

(12) Sterility.—A Guernsey cow bred twice without conceiving was examined as to the cause of the apparent sterility. The examination revealed a cervicitis, with no apparent abnormality of uterus, ovaries or tubes. This cow had always shown severe straining, lasting two or three days after each service, and as she had only been served three days before the examination the owner was advised to wait until the next estral period to observe whether she had conceived before any further treatment would be administered.

(13) Blackhead in Turkeys.—The flock roams the fields all summer and thrives well, but on returning to the buildings each fall they begin dying in a week or two, until all have succumbed. This has been an annual occurrence for several years. The owner was advised to quit keeping turkeys, as there is no known remedy for this unfortunate condition. The advice of Higgins to keep turkeys on a sterilized floor until they become immune from age (about one year) is not generally thought practical on the average farm.

(14) Hock Injury in a Draft Mare.—The mare was struck violently on the external face of the hock with the blunt corner of a plow potato digger. There was immediate lameness of a very grave type, and a trickling of synovia from the wound, which was about an inch long running across the hock from before backwards. The synovia was thought to come from the sheath of the lateral extensor (peroneus). A bit of sterile gauze was placed in the wound, while the surroundings were shaved and disinfected and then the wound was packed with cotton soaked in Flavisol and held in place with strips of adhesive tape. This was renewed twice a day for several days and then once a day thereafter. Recovery was complete in 15 days. There was no infection at any time. The great pain was due to the violence of the blow.

(15) Azoturia in a Driving Horse.—The attack was unilateral and mild. A dose of purgative and three days at rest brought a complete recovery.

(16) Unilateral Pneumonia in a Large Durham Cow.—The cow refused to eat and dropped off almost entirely in the flow of milk. The temperature was 106 degrees F., and the pulse 60 per minute. The respiration was rapid but not painful, and auscultation revealed the blowing rales of croupus pneumonia. The treatment consisted of a roomy, well-aired box stall and simple febrifuge remedies. The crisis was reached on the eighth day and convalescence was rapid. The tuberculin test after recovery was negative.

(17) Castration.—The flank operation was performed on two ridgling pigs seven months old, and the testicles recovered after the usual difficulty experienced by a novice. There were no casualties.

(18) Docking Lambs.—As there were only a few the operation was performed with due antiseptic precautions, and a ligature was kept on the stump for three hours to prevent bleeding. The amputation was done with a pair of scissors.

(19) Injured Hock.—In an automobile collision a horse hitched to a buggy was thrown down, and in struggling to rise kicked hard against the front end of the fifth wheel, causing a penetrating wound of the hock posteriorly. The wound bled profusely. A very intelligent owner bound it up with a wad of clean cotton and very ingeniously wrapped up the whole hock with bandages that were retained by sewing with a needle and twine. The wound was therefore in splendid shape for proper treatment when professional aid arrived the following day.

(20) Worm Infested Hogs.—A small herd of hogs were said to be infested with worms. The owner made the diagnosis and based it on unthrifty condition of the animals, and upon the observance of some large worms in one of the herd he had butchered some days previously. The fact that these animals were kept in a permanent hog lot used as such year after year, leaves little doubt that the diagnosis was correct. The animals were given a single dose of a proprietory worm capsule after 24 hours of dieting. There was no benefit derived from the treatment, and disgusted with his poor luck with pigs he sold them at a sacrifice. Thus in one case, at least, we confirm Hall's conclusions that a single dose of santonin is not to be regarded as a complete treatment for intestinal parasites.

City Practitioner's Cases.

These cases we believe to be sufficient evidence that a country practice is a kaleidoscopic enterprise compared with the following 20 cases in a city practice occurring consecutively during a period selected at random from records. In a practice where the city veterinarian makes some pretense to specialize on dogs more than was the custom in the establishment where these were taken the list would, of course, contain more dog,

cat and other small animal cases than is herein shown. The list is taken from May records so that the azoturias of winter and the heat-strokes and colics of the hot months would not monopolize the list:

(1) Chronic Laminitis.—The horse indisposed from lameness in one fore foot, examination revealed dropped soles on both feet. Neglected shoeing of feet that should be better cared for was the cause of the indisposition. Re-shoeing of the lame foot (the horse was too lame to shoe the other), a box stall and foot baths was the treatment.

(2) Influenza or Pink-Eye.—A horse purchased at the horse market was found sick three days later. The eyes were swollen, there were weeping tears over the cheeks, the fever was high, and the appetite poor. Examination indicated nothing very serious. As no complications occurred the patient yielded to simple medication and was ready for work in two weeks.

(3) A grocery horse kept in a boarding stable was reported as getting stiff in the fore legs. It was sent off the street to the stable the previous day by an officer of the humane society. Examination revealed navicular disease. The patient was past middle age and had poor feet, so only palliative treatment and advice to procure a new horse was recommended.

(4) A horse thin more from overwork and senility was thought to require some attention to its teeth to make it fat. The teeth were filed without a prognosis.

(5) A visit was made to a large stable where there were several animals needing attention. Two were lame and one was febrile, probably from influenza.

(6) A visit was made to a dealer's stable, where the usual horde of influenza cases in different stages and affected with different complications were examined and given the customary treatment.

(7) In a case of acute laminitis already under treatment for several days the patient was found in bad condition from the small quarters in which it was living. The eyes were closed from pounding its head on the bare floor, and the hips were already bruised, indicating serious complication from decubitis. As the little frame stable was the only available accommodation and the care was destined to be rather poor, an unfavorable prognosis was given. The whole situation was discouraging.

(8) A visit to a horse that had suffered from colic the previous day and which had not yet had a passage and was causing anxiety from that standpoint. The treatment given was more linseed oil, walking exercise and a little patience.

(9) In the case of a quittor that had been operated upon a month previously and which was still far from well the owner was advised to continue the irrigations until a second operation became necessary.

(10) A second quittor, operated upon several days before and which was being dressed for the first time, was visited.

(11) Palliative treatment was advised for a lame horse, apparently spavin, but diagnosis uncertain, with a view of preparing the owner to consent to firing the horse later on.

(12) Clipping and application of a parasiticide was advised in the case of a skin eruption in a dog, diagnosed as mange.

(13) In dystocia in a Boston terrier there was failure to deliver with forceps and the owner would not consent to more radical measures. The owner left the office disgusted, with his dog in a basket. The practitioner collected no fee at the time, and the bill is still unpaid.

(14) A case of median neurotomy in a light delivery horse.

(15) Extraction of a molar tooth with forceps was performed.

(16) The teeth of a horse not doing well were filed at the request of the owner.

(17) A visit was made to a case of colic that was apparently well on arrival. A capsule of ether was administered as a strategic precaution.

(18) Examination was made of a horse purchased the previous day as sound, but which was showing signs of heaves.

(19) Extirpation was made of a large sitfast of the neck that threatened to develop into a fistulous condition.

(20) A bad suppurating corn that was threatening to become a quittor was treated by paring and by antiseptic application.

If space would permit extending these lists into the hundreds the difference we are trying to illustrate would widen. It would show that the realm of the country practitioner extends into almost unlimited fields that are undeveloped because the curricula of the colleges have only begun to cultivate them. The practitioners of today, especially the older ones, were taught the infirmities of the horse. The remainder which now constitutes the major part of veterinary work in the country, was left to the practitioner's own resources, and the way he has adapted himself to meet the growing needs in so many directions is extremely creditable.

Cattle Practice

Edited by JOHN FRANCIS DE VINE, D. V. S.

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Function of the Corpus Luteum

EXPERIMENTAL evidence supports the theory that the corpus luteum is an organ of internal secretion and it is now generally conceded that its function is that of controlling menstruation and preparing and sensitizing the endometrium for the reception of the impregnated ovum. All of which seems entirely logical when we consider its wonderful influence upon pathological conditions of the uterus, such as lack of tone of its walls or catarrh of the mucous membrance of this organ, which so often accompanies hypertrophied and cystic degenerated corpora lutei and the correction of these conditions by their removal.

The removal of the corpus luteum when indicated has a wide service in sterility work. We have cautioned against such removal in early pregnancy unless abortion is desired. We have also pointed out the advantage of its removal in pyometra and catarrh of the uterus; likewise, in the article on "Mummification of the Fetus," we have advocated its removal and cited cases setting forth results, this notwithstanding that some other writers claim that its removal is ineffectual in the handling of a mummified fetus. This, however, has not been our experience.

When a corpus luteum is removed it is always well to apply pressure to the ovary for a short period after, since some workers report fatal hemorrhage following the operation.

If the cervix and uterus are quite normal and the ovaries not seriously pathological, the pressing out of a corpus luteum causes periods of estrum with astonishing regularity in from three to seven days; so much so that we have frequently been able to arrange for breeders to have several cows in heat during the same week, that they might have the service of a particular bull when available, or where the cows were to be trucked a considerable distance and the owner wished to have two or more ready for service but a day or so apart.

In the case of chronic degenerated corpus luteum, estrum may not appear promptly following its removal, but rather one or more small cysts may appear in the ovary in a few days and require further attention before estrum is regulated.

When to Breed.

The question is often asked: "Should an animal be bred at the first estrual period brought about by the removal of the corpus luteum?" This will depend entirely upon the individual case. If all organs appear normal the vagina and external cervix should be cleansed daily with a warm normal salt solution and the animal bred at once. But if other abnormal conditions exist, such as cervicitis or catarrh of the uterus, these should be corrected before the animal is allowed to be bred. However, the removal of the corpus luteum itself and the simple massaging will often either correct or greatly aid in correcting these conditions. A few typical cases associated with retained corpora lutea follow:

A three-year-old Holstein heifer had calved at 30 months, and gave every indication of a splendid future as a dairy animal; was bred at the second estral period after calving (about two months); showed no further evidence of estrum; was milked about five months, dried off and turned to pasture. Seven months after being bred she was taken off pasture and put under a ration to prepare for freshening. Eight months after date of breeding it was decided to have an examination made of the heifer, as she gave no evidence whatever of being in advanced pregnancy. I examined her one morning and found all organs, so far as I could determine, apparently normal. There was a rather large deeply imbedded corpus luteum in the right ovary which was easily removed under pressure. The animal came in heat the following Thursday, was bred and conceived.

A four-year-old Guernsey, bred three months previous, showed, upon examination, all organs apparently normal. A corpus luteum in the right

ovary was removed under pressure, which was followed by estrum in five days. The animal was bred, came in heat again in 21 days, bred again and conceived.

A Jersey heifer, three years old, had calved 12 months previously, live calf, but retained membranes; she received no special attention, but it was believed that most of the membranes dropped away after a few days. She had been having irregular periods of estrum during the past ten months, had been served four times by one bull and three times by another. Examination revealed a tight cervix apparently normal, excepting slightly sticky. The uterus was found a trifle flabby and a small amount of catarrhal exudate was squeezed out by gentle massage. A degenerated corpus luteum was located in the left ovary, broken up and removed, and an apparently normal false corpus luteum in the right ovary was also removed. The animal was in heat on the seventh day and manifested rather violent estrum from then on. She was examined the second time, 14 days later, and her generative organs all gave evidence of estrual congestion. Two comparatively small cysts were found in the left ovary. All organs were again massaged, the excitement ceased the following day, and an apparently normal estrum set in on the eighteenth day, when she was successfully bred.

Persistent Treatment Advisable and Necessary in Some Cases.

Let it be understood, however, that these simpler cases are the ones we pick out in herds on perhaps our first examination. It is rather a common experience to be asked to examine a number of animals in a herd where there is sufficient irregular breeding to warrant calling in an expert. Naturally, all animals toward which there is any suspicion directed are offered for first examination, and, as might be expected, if we examine a number of animals a majority of them at least suffer but slight deviation from the normal and respond promptly to rather simple manipulation. It is fortunate that this is so, because there is likewise usually mixed with such a lot some cases that were it not for the favorable and prompt response to treatment of the mild ones, the owner and perhaps the veterinarian would not have the patience to continue to treat. On the other hand, experience teaches us that in the case of valuable animals it is not good judgment to unhesitatingly condemn an animal as hopelessly sterile unless there are such severe and gross pathological changes in the generative organs as to make such a prognosis safe without peradventure.

When the uterus presents gross and serious pathological changes it is often comparatively simple to make a positive unfavorable prognosis, but it requires much experience and very positive lesions to condemn an animal outright, and it is not good judgment to condemn an animal as hopelessly sterile which is suffering from only moderate pathological conditions of the ovaries, even though the fallopian tubes be involved, unless the lesions of the tubes are so severe and plain as to make atresia positive.

Since constant care and patience will often work wonderful changes in some of these cases, and while one might condemn an animal in good faith as probably not warranting sufficient attention, still it is always well to make plain on what basis the animal is being condemned, because there is ever the possibility of such animals falling into the hands of someone else and receiving the necessary care, and allowing sufficient time for nature to correct or help correct the pathological conditions and thus controvert your opinion. This is particularly true with young cows. We frequently see this in cystic ovary or in cystic degeneration of the ovaries.

Corpus Luteum Extract.

The knowledge that the corpus luteum is a cyclic organ of internal secretion and exercises an influence on menstruation has been of much interest to the medical profession. Special studies, animal experimentation and clinical results have comparatively recently demonstrated the many uses and great value that either desiccated or soluble extract of this organ has on ovarian and uterine derangements of women.

Much study has been given to determine the difference, if any, in the chemical constituents of the two types of corpus luteum; that is, those that are styled true and those that are styled false corpus luteum. Up to the present time there has not been established an observable difference, and the belief is that the corpus luteum of estrum possess the same therapeutic activity as does the corpus luteum of pregnancy.

To study the clinical records on the use of this agent one is impressed at once with the wide range of cases in which this preparation is apparently of such great value in thwarting sterility, creating pronounced sexual desire, and relieving sufferers from chronic pelvic distress.

The particular conditions for which it is said to be serviceable are: (1) Functional amenor-

rhea or scant menstruation; (2) dysmenorrhea of ovarian origin; (3) manifestations of physiologic or artificial menopause, such as nervous or congestive disturbances of reflex origin (hot flashes, psychoneuroses, etc.); (4) "neurasthenic" symptoms of menstrual life; (5) sterility not due to pyogenic infection or mechanical obstruction; (6) where the function of one ovary is impaired, or one ovary has been removed and the compensatory activity of the other insufficient; (7) repeated abortions not due to disease or mechanical factors, and (8) hyperemesis in the early months of pregnancy.

Clinical data from most reliable sources record numberless cases of the various conditions here enumerated, in which little less than phenomenal relief has followed the administration of this preparation. While it is questionable if results could be obtained in our larger animals from this preparation that could not be obtained by mechanical manipulation, still this is an uncharted sea and we should not have too positive ideas on this point. In the case of the smaller animals where manipulation is not feasible its probable importance should not be overlooked. We are at the present time using it in a herd of valuable goats, some of which have for a long period failed to conceive. We will record our results later.

ACUTE ENDOMETRITIS IN COW.

Some time ago I removed a placenta from a cow, and flushed the uterus with a normal salt solution. The placenta was very tightly adherent and I was unable to remove all of it. A week later the uterus was discharging a dark-colored, foul-smelling pus. I flushed the uterus with potassium permanganate and after a few minutes followed with a normal salt solution.

As the cervix was so much contracted that I could not insert my hand to remove all the fluid from the uterus, I tried Dr. Albrechtsen's sterility catheter with return flow, but even with this in a recent gravid uterus there will be some fluid left inside.

Next day on examination the cow was found to be straining considerably, and when I attempted to flush the uterus she passed about half a dozen cotyledons. The same thing occurred the following day, with large blood clots discharged through the cervix.

From that time I have flushed the uterus daily, every other day and every three days, in all nine times, without recovery. The uterus now seems to be full of white cheesy material, but if I wash it out one day the next day it is just as bad. The last time I did not flush the uterus at all, but succeeded in squeezing out some of the cheesy material by massaging the uterus through the rectum.

Can you give me some suggestions how to handle such cases? I am referring now to recently gravid uteri where the cervix is closed to the extent that one cannot insert the hand. Should a placenta that is tightly adherent be removed? Should the uterus be irrigated after removing the placenta, and, if so, what kind of antiseptic should be used, and what should be the strength of it? Should an infected recently gravid uterus be irrigated where one cannot insert the hand to remove the fluid? What is the value of massage only for such a case?—O. W. J., Washington.

Reply—Please refer to my article on "Acute Endometritis and Retained Placenta," in VETERINARY MEDICINE, December, 1919. This covers in detail your question, but fearing you may not have the number I will answer briefly your four specific inquiries.

It is dangerous to remove manually an adherent placenta in our pure-bred delicate dairy cows. In the case you describe had you irrigated the uterus thoroughly daily, beginning 24 hours after the cow freshened, your treatment would have been more effective and you would not have had to keep up irrigation for such a long period of time.

I recommend thorough irrigation of the uterus with a warm normal salt solution where the placenta is retained, beginning, if practicable, 24 hours after parturition. I use no other disinfectant.

It is usually dangerous to douche a uterus after the cervix has contracted so much that it will not admit the hand. There is also great danger of douching a badly infected uterus with retained membranes after such a uterus had been neglected sufficiently long for the membranes to undergo putrefaction and the uterine walls to become degenerated.

Massaging a strong uterus that has been kept clean for several days is of positive value after the uterus has involuted sufficiently so that it can be massaged. Massaging the particular uterus in question would be beneficial if the walls are still strong. The accumulation of more or less catarrhal exudate is a natural sequence when an infected uterus is responding to treatment. The cervix should then be douched daily to relieve the cervicitis. Massaging such a uterus every three or four days for a few times is usually sufficient.—J. F. DeV.

Swine Practice

Edited by A. T. KINSLEY, M.S., D.V.S.

Save the Pigs

THIS is the season of the year when the practitioners should use every available effort in preventing the loss of the suckling pig. There has been rather extensive loss due to abortion, and this is all the more reason why the loss of the pigs that have been normally farrowed should be diminished to a minimum. During the last two or three years the loss of suckling pigs, particularly the spring crop, has been extraordinarily large. The causes of these losses have been scours, pulmonary ascaridosis, rickets, bull nose, sore mouth and goitre.

Pig Scours.

Pig scours may be associated with abortion disease of swine, but scours has been found in pigs on many premises in which there have been no losses from abortion. Pig scour may result from digestive derangement induced by improper foodstuff from the sow, or it may be due to infection from diseases of the udder and infections with the B. coli communis, B. suipestifer, B. paratyphoid, B. enteritis, and B. suisepticus. There is a possibility that other microbian agents may be a factor in the production of scour in pigs, and some investigators have indicated that protozoan parasites may be an important causative agent of this disease. Scour in pigs, particularly in those that are only a few days old, rapidly diminishes the resistance of the pig, and so debilitates the affected animal that unless immediate relief is given the loss of life is always certain.

It has been previously mentioned in this department that the practitioner should be more careful in making a diagnosis. Even if more time is consumed a proper diagnosis of the cause of scour in pigs will give the necessary information to correct treatment. If pig scour is found to be of dietary origin it can usually be easily and effectively corrected. If it is found to be due to infection then the proper biologic products can be applied and the disease usually overcome.

Pulmonary Ascaridosis.

Pulmonary ascaridosis is another very important and destructive disease of little pigs. The loss incidental to the larval form of the ascarid usually occurs in pigs from 10 days up to 30 days of age. Investigation of pigs over 30 days of age infested with the larval ascarids reveals that fatality rarely results, although it will diminish the vitality of the infested pigs, and they will not develop properly. The life cycle of the larval ascarid has been previously given in detail. Suffice to say at this time that pulmonary ascaridosis is a disease that is easily controlled. The essential feature of the control measures consist of rotation of pastures and hog lots, and thorough cleaning and disinfection of the hog houses, and repeated administration of efficient vermifuges to expel the adult ascarid. On farms in which the above is carried out the losses due to pulmonary ascaridosis have been reduced to a minimum.

Rickets.

Rickets is essentially a disease of malnutrition. It is probably a condition resulting from the lack of vitamines. It occurs during the development of the pig, and is manifested by digestive derangement, associated with disturbances of locomotion. Rickets frequently affects all the pigs in a litter, or if of dietary origin will affect pigs of various litters on the same farm. This condition is usually quite effectively corrected by the administration of lime salts in conjunction with codliver oil and nourishing feeds.

Bull Nose.

Bull nose (infectious rhinitis) is probably a specific infectious disease of pigs, characterized by inflammation of the mucous membrane of the nasal channel and related sinuses and by involvement and deformity of the facial bones. Bull nose is rather prevalent, and although it is not very fatal it is responsible for the failure of development in affected individuals. Pigs are predisposed to bull nose when they are kept in filthy pens, improper ventilated hog houses, and by inbreeding. It is possible that the B. pyocyaneous is the specific cause of this condition. The

symptoms manifested in bull nose consist of sneezing, watery discharge from the eyes and nose, which later becomes purulent. Affected swine have a tendency to root, and although they may eat heartily they do not gain in weight. In the latter stages there will be bulging of the facial bones. This lesion is usually accompanied with a peculiar blowing noise. Bull nose can be readily and effectively prevented by providing sanitary quarters and by the proper selection of breeding animals.

Treatment is of little avail, although in the early stages inhalation medication has been claimed by some practitioners to have given splendid results.

Stomatitis.

Sore mouth, or stomatitis, is a very common condition in pigs, and is responsible for the loss of a great many small pigs each year. This condition primarily occurs in swine kept in filthy pens, or in pigs that are impoperly housed and that are not fed proper rations. It especially occurs in pigs of large litters, probably because of under-nourishment. Various microbian agents have been found to be the causative factor of stomatitis. The B. necrophorous produces a distinct type of the disease ordinarily designated as necrotic stomatitis. The symptoms of stomatitis consist of listlessness; the affected pigs have a tendency to remain quiet, marked depression, and there may or may not be diarrhea. If the affected pigs are examined lesions of various dimensions will be found in the mucous membrane of the mouth. This condition can be quite effectively treated by curetting the lesions of the mouth and applying some good reliable antiseptic, such as tincture of iodin. When the disease has once made its appearance upon a farm, each pig should be carefully examined each day to determine whether or not any lesions exist, and all affected pigs should be treated daily as above described.

Goitre.

There has been some loss of pigs due to goitre. These losses have occurred particularly in the northern section of the United States. The cause of goitre appears to be a deficiency of iodin or iodin salt in the food. The affected pigs usually show an enlargement in the throat region at the time of farrowing. In many instances the affected pigs have no hair and are dead at the time of farrowing This condition can be prevented by administering iodin or iodin salts in minute quantities to the animals during the period of gestation.

Other conditions sometimes arise that are responsible for the loss of pigs. We have attempted to call the attention of practitioners to those conditions which are most common, and will be glad to answer any inquiries relative to the above described conditions or any others responsible for the loss of pigs.

INFECTIOUS ABORTION IN SWINE.

I would like to have your opinion on the following condition: Eleven sows in a herd of 18 have lost their pigs or aborted when about 60 to 70 days pregnant. The sows are fed a mixture of corn and oats, with plenty of pasture for exercise. All sows lose condition after abortion, but after about one week appear same as usual. No temperature or discharge.—P. and H., Iowa.

Reply—From your description there is apparently no doubt of the existence of abortion, which seems to be of an infectious character existing in the herd. As you perhaps know, abortion in sows can be produced by the B. abortus (Bang) that produces abortion in cattle. However, there is still some question as to whether or not this same organism is responsible for the large number of cases of abortion that occur in swine. In fact, some investigators have found a variety of organisms associated with swine abortion and only in certain instances have they been able to identify the abortion bacillus. If abortion exists in the cattle on the farm then, of course, the chances are much more in favor of the abortion in swine being produced by the B. abortus (Bang). If there is no abortion in cattle on the farm in which these hogs are maintained, then it is possible that the abortion is the result of a variety of infections. The after-effects indicate metritis, probably of a purulent type caused by various pyogenic organisms associated with the colon bacillus or some of its derivatives, and it is possible that the abortion in swine is caused by this same group of organisms. Some practitioners have claimed to have been able to prevent the occurrence of abortion in swine by the administration of three or four doses of bacterin containing the organism above mentioned.

I would suggest that all aborters be definitely and completely isolated from the remainder of the herd, and that a herd bacterin be made from the discharges of a recent aborter. I would also advise that this material be used in proper dosage on the sows during the period of gestation. The aborting sows should not be rebred for at least 60 days and not then if there is any discharge from the genital organs.—A. T. K.

Live Stock Poisoning

Edited by L. H. PAMMEL, Ph. D.

Professor of Botany, Iowa State College, Ames, Ia.

Capillary Poisoning and Shock from Ergot

IN A recent number of the "Bulletin" of the Johns Hopkins Hospital (31:257-260, f. 1-9) Dr. H. H. Dale discusses the interesting problem of capillary poisons and shock.

"Dr. Berger and I were asked in 1904 to undertake an investigation of the chemistry and pharmacology of ergot. We determined to take, one by one, any characteristic form of physiological activity which I could detect in the substance and its extracts, and to use each in turn as a guide to the chemical isolation and identification of the substance producing it. We believed the problem to be a difficult one, but it proved to have a complexity and an interest altogether beyond our expectation. It was our great good fortune to find in ergot a veritable treasure house of substances, presenting in intense degrees the most varied forms of pharmacological activity and in the study of these, my colleague and I wandered far from the immediate problem of the therapeutic action of ergot, into an investigation of the epinephrine type of action and its relation to the effects on true sympathetic nerves of the muscarine type of action and its relation to the effects on other nerves of the autonomic system; and into a study of the effects of substances producing a shocklike depression of the circulation, similar to that encountered in a large class of pathological conditions. It is to an analysis of this last-mentioned, curious and, as I believe, widely, significant type of action that I desire to ask your attention. In a second lecture I hope to deal with a special example of it in the so-called anaphylactic shock. In a third lecture I shall endeavor, by a transition which, as I hope to convince you, is less forced and abrupt than might appear, to pass from the anaphylactic phenomena to a more general consideration of the connection between chemical structure and physiological action, as illustrated by the action of certain groups of substances related to the other active constituents of ergot. For the present I invite your attention to a shocklike effect, on the circulation and other vital activities.

"We had long known that ergot extracts exhibited a direct and intense stimulant action on plain muscle, and in particular, on the plain muscle of the uterus. None of the principles which we had hitherto identified would account satisfactorily for this action, which, on the face of it, seems to be more directly related to the therapeutic use of the drug than the other types of activity which we had described. At length, after many methods had been tried in vain, Berger succeeded, by using Kutscher's method of separating such substances as the organic bases in meat extract, in isolating a base from ergot which produced this action with extraordinary intensity. One part of this base in 100 millions of solution had still a pronounced effect on the tone of uterine muscle. It proved to be one of the series of amines formed by decarboxylation of amino-acids. In this instance the parent amino-acid was histidine, and the identification of the base was greatly facilitated by the fact that Ackermann, almost simultaneously, produced it from histidine by the action of bacteria. General usage has conveniently and appropriately named it 'Histamine.' The interest of this substance, however, was by no means limited to its occurrence in and contribution to the activity of ergot. The significance of its action began to appear only when its physiological effects came to be more closely analyzed, and the investigation has led us far indeed from our original objective. When Laidlaw and I began to examine the action of this substance more closely, we soon recognized that it produced, in relatively minute dosage, a type of effect long

Readers are urged to take advantage of the opportunity offered by Dr. Pammel, for the identification of specimens of supposedly poisonous plants. Two good-sized specimens, carefully packed, should be sent to him direct, with such history as may be available. Simply mention that you are a reader of VETERINARY MEDICINE and no charge will be made for this service.

familiar, though incompletely understood. This type of action had, hitherto been identified with the action of certain products of the partial cleavage of proteins, such as the familiar Witte's peptone, certain protamines and histones, and the products of gentle alkaline hydrolysis obtained by Vaughan and his colleagues. It was, perhaps, of special interest that an action of this general type had been demonstrated with extracts from a large number of different organs of the animal body. Popielski had postulated the presence in all such extracts and hydrolytic products of a hypothetical principle, 'vasodilatin.' Just before we began to examine the action of histamine this type of action had acquired a new and absorbing interest from the fact that it was found to be faithfully reproduced in, to constitute, indeed, the complex of symptoms known as the anaphylactic shock, even to the details of variation which that phenomenon showed in the different species. So that within a single year this same complex of symptoms, hitherto known as the effect of products of protein digestion and of organ extracts, was found to be reproduced in the reaction of a specifically sensitized animal to a normally inert protein, and in the action of a pure base, obtainable by a relatively simple change from one of the amino-acids out of which the protein molecule is built.

"I need hardly indicate the temptation which was presented to any one coming upon these facts for the first time. I have mentioned Popielski's view that the various organ extracts and crude products of digestion owed their common type of activity to the presence, in varying proportions, of a single active substance. The idea that the anaphylactic phenomena were due to the production in the circulation of a substance of this type, by the action of a specific ferment, was already in the air. The suggestion lay near at hand that the long-sought active substance was 'histamine,' and that the production of the latter in the system was the cause of the anaphylactic shock. The temptation to make such a suggestion was even accentuated, when Berger and I were able to show that in one particular extract, that from the intestinal mucosa, histamine was actually present. The suggestion, however, was not made by us, though others were not slow to make it for us, and even to attribute to us the view that the anaphylactic shock was due to the liberation of histamine. The presence of histamine in extracts of other tissues than the intestinal mucous membrane, remained for us too highly speculative possibility; as for the anaphylactic shock, my own observations soon led me to a conception of this phenomenon in which histamine played no direct part."

RESTRICTED OATMEAL RATIONS AND REPRODUCTION IN CATTLE.

The question of balanced rations and reproduction in cattle has been reported from time to time in VETERINARY MEDICINE. The classic experiments of E. B. Hart, E. V. McCollum, H. Steenbock and G. C. Humphrey were reported in 1911 at the Wisconsin Agricultural Experiment Station. It was shown by these authors that rations restricted to the corn plant were highly successful for both growth and reproduction, while rations restricted to the wheat plant were disastrous to successful growth and reproduction. Hart, Steenbock and Humphrey now report on the matter of "Influence of Rations Restricted to the Oat Plant on Reproduction in Cattle."

(1) A ration made from the oat plant was inadequate for efficient nutrition of breeding cows. The offspring were born prematurely and were either very weak at birth or born dead.

(2) Additions of fat soluble vitamine or casein, or both factors, to a whole oat, oat-straw ration did not improve it for reproduction.

(3) Fortification of the oats plant with calcium salts either as a carbonate (wood ashes), as a phosphate (floats), or as calcium acetate greatly improved conditions for reproduction. Sodium chloride was always allowed. Under the influence of these additions offspring of fair vigor were produced. This improvement in the ration was secured even without the addition of a better protein or more fat soluble vitamine to the oat-grain, oat-straw ration.

(4) The "synthetic ration" apparently did not secure as strong offspring as were produced by the use of natural roughages such as corn stover, clover, alfalfa and marsh hay. The latter was grown on an alkaline marsh and gave surprisingly good results.

(5) It would appear from this data that the ration of a dry breeding cow, where all other nutritive factors are satisfied, should contain at least 0.45 percent of calcium oxide. This figure may not apply to a ration containing some fresh, green materials.

(6) Brief presentation is made of an hypothesis explaining the results secured, with suggestions for future work. Furthermore, attention is called to the practical significance of these studies as relating particularly to forage and acid soils.

Laboratory Diagnosis

Edited by C. A. ZELL, D. V. M.

Infectious Abortion in Swine

I AM sending an immature fetus of a pig and some placenta. It is a specimen from a sow which aborted 13 pigs. This is the fourth sow aborting in the past two weeks in this lot. Please make a correct diagnosis of this trouble. My diagnosis is contagious abortion. These hogs are fed the best of feed we have in Iowa, and are pure-bred Chester Whites.—A. S., Iowa.

Reply—The specimen of fetus and placenta of the sow were received in good condition and a thorough examination made. The bacteriological examination did not show any abortus bacillus present, but a number of organisms belonging to the colon group (bacillus aerogenous, etc.).

We would suggest that you send in blood samples from the sow, so that we may be able to do some experimental work in the way of the compliment fixation test or the agglutination test to determine whether or not contagious abortion is present in the herd.

In the meantime, we would suggest also that you take some swabs from the cervix of the affected sows and submit same for further examination.—C. A. Z.

Directions for Packing Specimens for Laboratory Examination

1. Gross anatomical lesions, where a bacteriologic examination is desired, are best sent packed in an ample quantity of borax. A corrugated paper or wooden box is preferable to an air-tight container (can). As second choice, such specimens may be carefully wrapped in cloth, wet in a 10 percent formalin solution, properly boxed.

2. Specimens of tumors or other tissue, not for bacteriological examination, may be sent in a 4 percent formalin solution.

3. Specimens of blood, pus and body fluids for bacteriological examination or for serum tests should be drawn aseptically and sent in sterile containers (small bottles boiled and cooled), air-tight. Such specimens should reach the laboratory quickly. If sent by parcel post, should be sent special delivery. It is best to send blood, pus and body fluids by first class mail, special delivery. If the quantity of pus is small, dilute with sterile normal salt solution to prevent drying. Sterile containers supplied free on request.

Chemical analyses cannot be furnished free of charge, owing to the vast amount of work involved.

Send all correspondence and specimens to Veterinary Medicine, 53 W. Jackson Blvd., Chicago, Ill.

MASTITIS DUE TO MIXED INFECTION.

I am sending a specimen of milk taken from a cow affected with what I consider to be udder pyobacillosis. The symptoms were as follows: Temperature was 105.1 degrees, respiration and pulse normal. The cow manifested a marked anorexia and a general weakness. The milk was at first lumpy and the affected quarter was hard, warm and painful in the first stages. She had given birth to a calf six days previous to the first time that I visited her.

Treatment: Internally, one ounce of formalin daily and one ounce of sodium hyposulphite twice daily; streptococcic bacterin every third day. Externally, fomented the affected quarter with a solution of magnesium sulphate as hot as could be used, then rubbed in fluid extract of phycolacca and olive oil equal parts. The fomentations were applied every three hours and the other application twice daily. Three days after this treatment was begun I injected into the affected quarter air and 3 percent boric acid solution alternated with a 1 percent chlorazene solution, and continued daily until present time. All precautions were taken in regard to asepsis. The cow is giving a good quantity of milk from the healthy quarters now, and is eating well. Kindly examine this milk for organism and any suggestion as to treatment will be appreciated. The above treatment was not successful. What is your judgment as to the quarter returning to its milk secretion at the next lactation period? Would it have been better to "dry up" the affected quarter at first, and if so what would be the best drug to use and not diminish the milk in the other three quarters?—C. W. B., Kansas.

Reply—The specimen of milk has been examined and besides streptococci a large number of staphylococci and diplococci were found. This explains the comparatively unsatisfactory results obtained from the use of a streptococcus bacterin. In this particular case, I would suggest that you have an autogenous bacterin made from all the

pathogenic organisms found in the milk. Excellent results have also been obtained from the injection of Flavisol into the affected quarter of animals in cases of this kind.—C. A. Z.

LYMPHATIC LEUKEMIA IN COW—ARSENIC POISONING IN HORSE.

I am sending you a sample of blood and a specimen of lymph gland taken from a four-year-old cow with the following symptoms: Greatly emaciated, very weak, mucous membranes pale, pulse normal, dyspnea in the later stages of the disease, appetite fair, evacuations normal.

This animal became sick about eight months previous and laid in recumbent position for about three weeks. After treatment with sodium cacodylate the animal apparently made a recovery. However, after four or five months she began to fail as in the previous attack and succumbed shortly.

This animal had received two tuberculin tests which proved negative. Postmortem examination revealed right lung very hemorrhagic and atrophied; the left lung normal; and the heart hypertrophied. All organs of the abdominal cavity were apparently in a normal condition with the exception of the lymphatics. In addition to the above, I am sending for chemical analysis a sample of stomach contents from a horse which died mysteriously.—C. M. F., Illinois.

Reply—Referring to the cow a bacteriological examination failed to reveal any pathogenic organisms, especially no tuberculosis bacilli were present. I would pronounce the trouble to have been "lymphatic leukemia."

Regarding the horse, chemical analysis showed arsenic present.—C. A. Z.

NERVOUS FORM OF HEMORRHAGIC SEPTICEMIA IN COW.

I am sending you some specimens of the heart, lung, kidney and lymph glands taken from a cow showing the following symptoms. The owner noticed the animal showing a staggering gait, jerky movements of the hind quarters, and rubbing the posterior parts against the other stock or a fence. In an hour the animal was down, showing spasms and grinding the teeth; there was profuse salivation and muscular spasms, and a pronounced edema of the vulva. The temperature was normal, respiration normal and pulse weak. The animal was unable to stand after going down.

Examination revealed some of the mucous plug loosening from the os uteri. On postmortem examination I found congestive changes in the lymph glands, congested lungs, petechia on the heart, congestion of the kidneys and liver, also inflammation of the intestines.

Have another animal with the same symptoms. This animal has been with the remainder of the herd, in a field containing cornstalks, some cane and millet.

Laxatives and serum were used in treatment. My diagnosis until I hear your findings indicate hemorrhagic septicemia.—J. V. H. S., Iowa.

Reply—There were a number of bipolar organisms (B. bovisepticus) present in the specimens of the various organs which you sent. These findings, coupled with the symptoms shown, point to the case as having been the cerebral or nervous form of hemorrhagic septicemia.—C. A. Z.

HEMORRHAGIC SEPTICEMIA IN HOG.

I am sending sample of blood and spleen from a hog. I believe death due to hemorrhagic septicemia, but I desire a positive diagnosis from you.—W. H. W., Ark.

Reply—The sample of blood and spleen from a hog which you sent us sometime ago, was received in good condition. Your diagnosis of hemorrhagic septicemia was correct. A microscopic examination showed the bipolar organisms of hemorrhagic septicemia to be present in large numbers.—C. A. Z.

MIXED INFECTION IN SWINE.

I am sending you specimens of lung, liver, heart, kidney, spleen and skin taken from a pig about two months old, one of a number similarly affected.

The first thing noticed about the pigs were small skin lesions or bumps as the owner calls them. Soon after the skin lesions appear the pig becomes unthrifty and has a diminished appetite. The disease runs a course of two to six weeks. There is usually a cough in the later stages of the disease. Hog-cholera vaccination has no effect on these pigs, as they develop it before and after vaccination.

Only small pigs from two weeks to two months old seem to be affected. This condition has been going on for three years in almost every litter of pigs on this farm. About 50 percent of the pigs are affected and about 40 percent of them die.

Postmortem examination of this pig showed a pneumonia, hemorrhagic areas or petechia on the heart, kidneys, liver and lymph glands. The mucous membrane of the intestines and stomach

was slightly thickened and discolored with one old ulcer of the stomach.

A laboratory diagnosis, suggestions and treatment will be appreciated.—J. L. R., Georgia.

Reply—The specimens of the different organs showed a typical suppurative broncho-pneumonia; the kidneys showed hemorrhagic nephritis; the liver and spleen were congested and the heart muscles showed fatty degeneration.

The bacteriological examination revealed a mixed flora of a variety of pathogenic organisms such as streptococci, staphylococci, bacillus pyocyaneous, etc.

We are of the opinion that this is a typical mixed infection, a condition which is quite prevalent in certain hog districts, and to our knowledge can only be combatted by the use of an autogenous vaccine made from this particular herd, and the subsequent immunization of all the pigs on this farm.—C. A. Z.

CONTAGIOUS ABORTION NOT PRESENT.

I am sending a tube of blood for laboratory examination.

I am in charge of a herd of dairy cattle, in which for the past six months, all cows have aborted at from five to seven months. Kindly let me know if they have contagious abortion.—J. E. M., Ohio.

Reply—A complement-fixation test for contagious abortion was negative.—C. A. Z.

HEMORRHAGIC SEPTICEMIA IN CALF.

I have mailed you specimens of the liver and spleen of a calf which died, I believe, from hemorrhagic septicemia. The history was as follows: The owner called me over the phone and told me he had a calf which seemed to be troubled with scours and asked me if I thought castor oil would be all right. I told him I thought it would. He called and reported the next day that the animal was the same, so I suggested that he repeat the dose and give a pint of laxoleum with it. Not hearing from him the next day I supposed the animal to be better. Two days later he called me and told me that the calf's eyes were becoming clouded and asked me to come out, which I did, and found the animal in a very weakened condition, with temperature of 104.5 degrees, pulse very rapid, mucous membranes extremely icteric, and sight apparently gone entirely. My prognosis was unfavorable.

I gave the animal hemorrhagic septicemia bacterin and also 30 cc. of flavisol intravenously. I left some stimulants. The following morning he reported the animal dead, so I immediately made a postmortem examination and found hemorrhagic areas over the small bowels, kidneys, bladder, liver and spleen, also on the heart and large patches over the lungs.

Not having been troubled with this condition here before, I am anxious for your report on the specimens and also your opinions of the case as to the line of treatment.—S. P. H., Michigan.

Reply—The bipolar organism was found in the specimens. Your diagnosis was correct.—C. A. Z.

EXAMINATION FOR RABIES.

We sent a cow's head to your laboratories for examination for rabies, and would appreciate a diagnosis.—F. & M., Ohio.

Reply—No negri bodies were found in the head of the animal sent in. Further, on inoculation tests the experimental animals remained healthy, which would indicate that the animal did not suffer from rabies.

However, permit me to remind the querist and all others that in sending in specimens for examination, a complete history of the case together with any symptoms observed should always be given. It should be kept in mind that the answers published in these pages are not for the querist only, but for the information of all readers of VETERINARY MEDICINE, and oftentimes the entire usefulness of an otherwise interesting case is lost to the third party because of the failure of the querist to give a clinical picture of the case from which the specimen was taken. While on this subject I want to remind all that a letter explaining what examination is desired should accompany all specimens. It is much too common to receive a specimen at the laboratory without any other information other than a card showing its source. Under such circumstances, of course, no examination is made. In this particular case it was two weeks after the specimen was received before we receivd any word from the doctor as to what was wanted.—C. A. Z.

TUBERCULOSIS IN CHICKENS.

I am sending you the liver and intestine of a hen which died recently. The owner has lost about 15 birds this winter and intends to put a stop to it if possible.

The disease appears to be rather chronic, with a gradual loss of appetite and drooping position of the affected birds. I diagnosed the condition as entero-hepatitis, but would greatly appreciate

receiving your diagnosis and possibly a suggestion as to treatment.—E. A. S., Wisconsin.

Reply—The tubercular bacilli were found in moderate numbers in the liver. This would explain the chronic infection in the flock or at least in the chicken from which the specimen was taken.—C. A. Z.

ROUND-CELL SARCOMA IN CALF.

I am sending you a specimen of a tumor from a nine-month-old calf. The history of the case is as follows: On March 1 the owner noticed a swelling on the calf's neck. I was called to see the case on March 4, at which time the swelling was very noticeable on the lower part of the neck. No treatment was given. The animal had a normal temperature and would eat some hay. I was informed that the swelling was getting larger, and on March 22 the animal was destroyed. On postmortem examination I found what I suppose was a tumor of some description. The enlargement weighed about ten pounds and extended from the pectoral region nearly to the throat. At the time the animal was destroyed it was down and would not have lived more than a few hours.—H. R. H., Illinois.

Reply — Examination of the specimen sent showed it to be from a round cell sarcoma of a very malignant type.—C. A. Z.

SWINE PLAGUE.

I am sending specimen of a hog's lung, spleen, kidney and liver. This hog was sick for about two weeks. There were four deaths previous to this one, which the owner posted and found about the same lesions as I found in the lungs, with the exception that I also found a few lung worms. —C. E. H., Indiana.

Reply — Plentiful numbers of suisepticus and streptococcus were found in the lung and which also showed typical lesions (marbled) of swine plague. Liver showed cloudy swellings. A diagnosis of swine plague is justified from these findings, and swine plague bacterins are indicated.—C. A. Z.

CHRONIC ENDOMETRITIS IN COW.

I am sending two bottles of vaginal discharge from a cow that is sterile. This animal has been mixing with a herd affected with contagious abortion, and I want to determine if this herd is also affected. If the specimen is not too badly contaminated I wish you would give me a definite answer, negative or positive.—D. A. B., Michigan.

Reply — A bacteriological examination of the specimens sent in showed some saprophytes, a great number of colon bacilli and the b. pyocyaneus, but no b. abortus. It is perhaps safe to exclude abortion on these findings, but if the case is an important one it might be well for you to send a sample of blood from this animal for a serological test.

The findings indicate that the animal is suffering from chronic endometritis, for which an examination should be made and treatment undertaken in the manner outlined by Dr. DeVine in recent issues of VETERINARY MEDICINE.—C.A.Z.

MILK DANGEROUS FOR FOOD.

I am sending you a sample of milk for examination. I would like to know if it is fit to use for food.—The cow is suffering with endometritis following the removal of a dead fetus two weeks ago.—H. W. U., Pennsylvania.

Reply—The sample of milk contained numerous streptococci and diplococci. It is dangerous for food. Such organisms are liable to cause septicemic sore throat or other serious trouble.—C. A. Z.

ARSENIC CAUSES DOG'S DEATH.

I am mailing you stomach of a dog. I wish you would make chemical analysis of it. From the post-mortem lesions I suspect arsenic or phosphorus poisoning.—J. H. L., Kentucky .

Reply — Chemical examination of the specimen sent revealed arsenic sufficient to account for the death of the animal.—C. A. Z.

ECHINOCOCCOSIS IN COW.

I am sending you a lump taken from a cow's liver, a portion of liver, and a small piece of peritoneum in which I suspect echinococcosis. Please make laboratory examination and report findings.—D. L. H., West Virginia.

Reply—Your diagnosis is correct. The specimen contained many echinococcosis polymorphous, the larval stage of the taenia echinococcus.—C. A. Z.

STREPTOCOCCIC SEPTICEMIA IN COW.

I am sending a specimen of blood from a cow for examination. This cow was near death and showed rapid emaciation. Kindly advise me of your conclusions.—W. H. E., Mississippi.

Reply—The specimen of blood contained streptococci and diplococci, indicating that the cow's death can be attributed to a streptococcic septicemia.—C. A. Z.

Parasitology

Edited by MAURICE C. HALL, Ph.D., D.V.M.

Strategical Aspects of Anthelmintic Medication

WORMS are animals, and the anthelmintic treatments intended to destroy them are not so widely remote from numerous other measures for the destruction of injurious animals, such as the insects that attack our plants and animals, the rats and mice that destroy foodstuffs and other property, the foxes, wolves and other carnivores that kill live stock, or even the human enemy that brings about the destruction or property loss of persons who are associated with us by political, racial or geographical affiliations. In other words, man engages in war upon animals that injure him or his property, wielding against them weapons adapted to the destruction of these animals. These weapons are broadly those causing traumatic damage, toxic injury and such physiological conditions as starvation, asphyxiation, etc. Against insects man uses poison and poison gas as insecticides. He makes alliances with their insect and bird enemies, raises against them the food blockade of crop rotation, and snares them with trap crops. Against rats and mice he uses traps, guns, poison and poison gas, and blockades them with rat guards, wire and concrete. Against carnivores he uses guns, traps and poison, and calls his allies, the dog and horse, into the field against them. Against his human enemies he unlooses his most destructive cutting, piercing, crushing and toxic weapons, artillery, machine guns, rifles, bombs, bayonets, traps and poison gas; he calls to his aid horse and dog, and even the gentle carrier pigeon; he blockades food and supplies that hunger and cold may work for him against his foe.

Warfare on Worms Practically Limited to Use of Poison.

Under the peculiar circumstances of warefare against the worms, most of the weapons named cannot be used, and we are limited for the most part to the use of poison. Traumatic attack is only possible in the case of the limited number of worm parasites which are amenable to surgical treatment, such as the hydatid. Traps are rarely useful, although the method of extracting the guinea-worm by grasping the head end with a split stick and slowly winding the worm into it is really the employment of a sort of trap. It might also be mentioned that there is in the patent office at Washington, D. C., a patent for a tapeworm trap which is to be baited and swallowed, the idea being that the worm would put its head into this trap to get at the bait and would be pulled out by the trap as it passed in the feces! But while our weapons against worms are mostly poisons, we have a large number of these weapons in the form of substances that have been employed as anthelmintics.

The conditions under which the warfare against worms must be carried on are peculiar. The worms must be driven out from a terrain which may be likened to the territory of a friend and ally, and their destruction must be accomplished with the minimum amount of damage to that terrain in the shape of injury to the host animal. This constitutes a sharp limitation to our offensive as regards the nature and amount of anthelmintic poison that may be administered. If it were not for this we might swoop out all of the worms in the digestive tract by large doses of carbon disulphid, oil of chenopodium or sulphuric acid. As it is, some things may not be used at all and others must be carefully measured to the dose that will steer a narrow course between failure of anthelmintic action and serious injury to the host animal.

Effectiveness of Attack to Be Judged by Enemy Casualties.

The warfare must be carried on in the dark, against an unseen enemy whose presence is only manifested by the injury to the occupied terrain and the distant reflection of this damage elsewhere, and by the eggs and enemy dead that leave this terrain in the current of undigested material that flows intermittently through it. In such night warfare no star shells have yet been used to detect the movements of the enemy or to determine the effect of our attacks. This

darkness is a serious handicap, more so in human medicine than in veterinary medicine. The physician must launch his attack and then judge its effectiveness from the enemy casualties, without weighing those casualties against the survivors, since these are an unknown quantity. He must make his judgment regarding the survivors on the basis of clinical improvement in patients and of evidence in the dejecta in regard to survivors present. To obtain additional evidence he may launch a second attack and estimate from the casualties the success of the initial attack. But even if a third and fourth attack bring to light no more enemy dead, this is not proof that no enemies have survived, since the hardy or fortunate survivor of a first and second attack may survive a third and fourth by virtue of hardiness or fortune. The veterinarian, more fortunate, may adopt training camp tactics on a selected terrain, and after fighting his battle in the dark may uncover the terrain of action and determine in daylight his misses as well as his hits, and the survivors as well as the casualties.

It is precisely this fortunate circumstance as regards the position of the veterinarian which has made it possible in a comparatively short time to select a number of effective weapons, known to be effective from such training camp tactics, against worms in what appeared to be almost impregnable positions in such diverse terrains as are afforded by carnivores (dog and cat), ruminants (cattle and sheep), ungulates (swine) with comparatively simple digestive tracts, and those with enormously developed large intestines (horse, ass and mule), and birds with the complications of a crop, gizzard and long-paired ceca. Compared with the complications presented by the ruminant stomach and the large intestine of the horse, the terrain over which the physician must attack is elementary in its simplicity, but in a comparatively short application of training camp tactics the veterinarian has been able to set aside from his armamentarium dependable weapons against a much larger number of worms than those on which the physician in general is waging war.

Doubtful Interpretation of Fecal Finding Severe Handicaps.

The physician, owing to the fact that circumstances do not permit of such sham battles, is still struggling with the selection of weapons amid a considerable uncertainty arising from the doubtful interpretations of fecal findings in regard to worm casualties unsupported by postmortem evidence in regard to survivors. To be sure, the veterinarian's attack with well selected weapons may fail at times from the peculiarities present in an individual animal, but this does not diminish the value of information as to how these weapons will act in the normal animal of a given species. In actual practice, too, many veterinarians and physicians have accepted any enemy casualties as conclusive evidence of an overwhelming victory.

What we have learned in regard to our anthelmintic weapons is enough to warrant us in the belief that this group of drugs will ultimately constitute a dependable medicinal group, from which the veterinarian or physician may select with certainty the precise substance in the approximately exact amount to secure practically 100 percent efficacy against a given worm in a given location of a particular host animal. But what we have learned is a small part of what we should learn and what we may reasonably hope to learn. Most drugs may be tested by one of two methods—the chemical and the physiological. The anthelmintics must be tested by both of these methods and also by the practical test method referred to in the foregoing as the training camp method in anthelmintic tactics, i. e., the administration of anthelmintics to test animals followed by examination of the feces for worms and finally by postmortem examination.

As regards chemical examination we have many anthelmintics concerning which much more should be known. Many of them, such as male fern and oil of chenopodium, are so complex that they constitute a sort of shrapnel which may register some shots on the worms, but must register practically all spots on the terrain; if any of these toxic or irritant constituents may be omitted without lowering the anthelmintic efficacy a regard for the host animal requires that they be omitted. Only a critical test of these constituents can determine such points.

As regards physiological tests of these drugs, such testing is absolutely essential in the case of such toxic substances as anthelmintics. Every new substance proposed as an anthelmintic must carry credentials as regards its safety for the host animal. It is important to know that chenopodium is a gastro-intestinal irritant and is constipating, that santonin is not a gastro-intestinal irritant, and that chloroform causes acute yellow necrosis of the liver, as such facts must be considered in weighing indications and contraindications for the use of such anthelmintic weapons. (To Be Continued)

Queries and Answers

Post Parturient Impaction and Cattle Purgatives

SOME time ago I was called to attend a sick cow. The cow had given birth to a full term calf six days before, and the afterbirth passed without manual assistance. I found the vulva and rectum swollen and edematous; the cow was straining severely, the pulse weak, and the temperature normal. Examination of the rectum revealed dry hard feces. The cow had not eaten for several days. The cervix was not yet closed, but the uterus seemed healthy.

I diagnosed the condition as a severe case of constipation and gave two pounds of magnesium sulphate in one dose, and ordered one-dram doses of fluidextract of nux vomica to be given three times daily. The cow died within 20 hours. A few days later I was called out to the same farm. This cow had also given birth to a full term calf three days prior. She first showed symptoms of illness the same morning, while the first case described had been sick for six days. She had a strong pulse, temperature 98.5 degrees, straining, no appetite, uterus clean, but cervix not closed. Rectal examination revealed no feces in the posterior portion of the rectum. The diagnosis was impaction.

I gave her two pounds of epsom sales, one ounce of powdered aloes, and one-half ounce of calomel in one dose, and one-dram doses of fluid extract of nux vomica every four hours. This cow died within 24 hours.

On account of the repetition of the same trouble on the same farm immediately after parturition or a few days after, I should like your opinion as to the relation of this condition to parturition. Was my diagnosis correct? Was my treatment correct? Do you think the dosage large? Out in the West we usually have to give large doses of the purgative salts and aloes.

The cattle had been grazing all winter on sage brush and dried bunch grass land, and fed mornings and evenings on alfalfa hay, straw, bran and shorts. No grains were fed. They were in rather poor condition, but western cattle are as a rule hardy, and get along with very little care and feed.

Could the feed have anything to do with this condition? I have read about the alfalfa dodder, a parasite sometimes found on alfalfa hay, and reported as sometimes causing digestive disturbances in horses and cattle. Several farmers have had trouble from feeding alfalfa hay during the past winter.

Your information and suggestions will be highly appreciated.—O. W. J., Washington.

Reply—In reference to the two cases of impaction in cows, any information I may attempt to give you on the subject will be based, of course, largely upon eastern conditions and dairy cattle.

In the first place it is my judgment the cases you cite had not received proper feeding or preparation for freshening. We would not think of feeding any dry bulky material like straw to our dairy cattle just before freshening, or just after. We take the greatest care to feed them a laxative succulent diet for a week or so before freshening, and for at least two weeks after freshening. The custom of depending upon cathartics at freshening time is disastrous and bad practice. It is no more malicious, however, than the advice we have received in the past from text books and otherwise to give "large full doses of epsom salts or other cathartics."

Experience has long since acquainted us with the dangers of large doses of drastic cathartics for cattle. We are thoroughly convinced that small repeated doses of saline cathartics are far more effective and safer. We likewise have learned from experience the advantage of sodium chloride and the need of intestinal stimulation, if we are to expect satisfactory results from cathartics.

In my early experience in cattle practice I suffered like other young and inexperienced practitioners, because I had been led to believe that saline cathartics in most any size dose could be given with impunity to the cow. I believe some are still of that opinion, but I want to state with all positiveness that this is not so with dairy cattle, at least, and that large doses of epsom salts will frequently prove fatal or so upset the digestive tract of a cow as to bring on a per-

sistent anorexia that ultimately ends in death.—J. F. DeV.

Comment: I wish to add a few words to the valuable advice given by Dr. DeVine to O. W. J. and those similarly situated, and that is that too often the very great value of carminatives in cattle purgatives is entirely overlooked.

The carminatives that I especially refer to are tincture of ginger in about a three or four-ounce dose or tincture of capsicum in a two or three-ounce dose, or on account of the present expense of these two preparations of ginger and capsicum, powdered ginger may be used in about one-half-ounce doses and powdered capsicum in about three-dram doses (larger in some cases).

Carminatives are useful in purgatives for all animals, but especially so in cattle and under the conditions mentioned by the above querist. They are really life savers, insomuch as they insure the action of a considerably smaller dose of the active purgatives; that is, combined with a carminative 20 ounces of a saline purgative will act as thoroughly or more thoroughly than 24 ounces without the carminative. A pound and a half with a sufficient quantity of the carminative will be as active as two pounds without. They not only insure the action or desired results from a smaller dose of the purgative, which of itself lessens the depressant action of them, but they also act as stimulants, both generally and in a stomachic way. They prevent the griping that frequently accompanies purgation, and a patient so treated will much more quickly return to a normal appetite.—E. L. Q.

BACILLUS NECROPHORUS INFECTION IN HORSES.

Will you kindly send me treatment for salt-water infections of the coronary band of the horse's foot. Horses employed in the oil fields commonly get caulked, snagged or scratched in the region of the coronary band. The salt water or water from an oil well shot with nitro-glycerin infects these injuries of the coronary band, and if not properly treated these infections will spread all the way around in 36 to 48 hours. I have known cases where the hoof dropped off in seven days.

Any information you can give me in regard to the treatment of such cases will be appreciated. —J. R. McK., Virginia.

Reply—What you term salt-water infection is due in part to the caustic effects of concentrated salt solution, and also, with considerable emphasis on the latter, to infection by the bacillus necrophorus. If you had a laboratory examination made you would find the substance to which you refer teeming with the before-mentioned micro-organisms.

Oil of turpentine has, in my experience (and I have used a vast amount of it), been the best destructive agent against this organism, and the most valuable agent to check the suppurating and sloughing process. Prescribe undiluted oil of turpentine or, merely to disguise it, you may mix 1 ounce of liquid oil of tar with 1 pint of turpentine. Apply on absorbent cotton two or three times daily, continuing it until all signs of sloughing have ceased, and then treat as a simple wound.

Turpentine is a powerful capillary stimulant, and by stimulating the sluggish circulation you will find that skin that has already turned dark blue or purple will, under its use commonly become normal, instead of going on and sloughing away.—E. L. Q.

PROLONGED DELIRIUM AND CONVULSIONS IN DOGS.

I am meeting with a condition among dogs here that I would like to have your advice about. About the first symptom noticed is one of fright, the animal seeming to be scared of something, running, barking, howling and finally having a convulsion. This keeps up for several days, when the frightened condition seems to subside. The convulsions, however, continue for some time, and recovery takes place in two or three weeks. The temperature in all cases so far has been normal, and both sexes are affected. Elimination is the only treatment I have used, except sedatives for the more excitable cases. I first noticed this condition about 60 days ago, and those cases that have seemingly recovered have had no recurrence of the trouble since. Any advice that you can give me as to a diagnosis and treatment will be greatly appreciated.—L. S. B., Arkansas.

Reply—It is our opinion that the condition described by you is due to worm infestation, and in our experience it is the whip worm that most often causes the identical condition described

The whip worm is removed with difficulty as it infests principally the cecum. The best known treatment to eradicate it is daily moderate doses of santonin. Inasmuch as you do not mention breeds or ages of your patients we cannot give you any specific dose, but where a pup is about four to six months old, of the Boston terrier size, you may give from one to two grains of

santonin once daily, which may be administered in capsules or tablets. We would recommend giving it with about equal quantities of calomel. Combined santonin and calomel tablets are on the market.

These should be continued for about two weeks. However, I usually drop a day or two, according to the condition of the patient and his behavior under the drug, at the end of each five or six-day period, at which time I administer a dose of castor oil, sufficient to cause free catharsis.

The condition described by you may be caused by an overloaded stomach, or the stomach containing some indigestible material, like a fried egg, which a dog will commonly swallow whole. However, if caused by the latter condition and the stomach is emptied by means of an emetic, preferably apomorphin hydrochlorid administered hypodermatically, the convulsions should cease almost immediately and should not return. Where the case is as described you will usually find them to be due to intestinal parasites of one species or another. If due to worms other than the whip worm oil of chenopodium in doses of from 5 to 30 minims, with a sufficient amount of castor oil to cause active catharsis administered every other morning for three doses, and repeated in about two weeks, is most proficient.—E. L. Q.

JOHNE'S DISEASE.

A few days ago I was asked to examine a three-year-old heifer which had calved about one month previous, and appeared quite well until five days before I saw her. She then started with diarrhea containing gas bubbles.

The appetite was good. There was no rise in temperature, but the animal was losing flesh, and the milk yield diminishing. The rectal mucous membrane was thrown into folds and very easily abraded. The feces, when I examined her, were pultaceous and contained a few gas bubbles. Organisms resembling the bacillus of Johne's disease demonstrated in the feces and portions of the rectal mucous membrane by the acid fast method.

What is the incubation period of "Johne's" disease? Has this animal been infected more than six weeks, or is the rectal mucous membrane only attacked in this case?—W. E. A., England.

Reply—We do not believe there is any doubt at all regarding the correctness of your diagnosis of Johne's disease. The incubation period has never been definitely ascertained on account of the very slow insidious onslaught of the disease.

The involvement of the rectal mucous membrane is not at all unique, as you will find in Vol. 1, page 665, second authorized edition of Hutyra & Marek, Meyer is quoted as saying in a great number of autopsies he found the colon and rectum involved in 32 percent.—E. L. Q.

LAW AS APPLIED TO REFUSAL OF PROFESSIONAL SERVICES.

In reference to the article in VETERINARY MEDICINE for February, 1921, page 57, entitled "A Fine Point of Law," by H. L., Oklahoma, I desire to add further inquiry on the subject, especially regarding the reply in the last paragraph by E. L. Q.

The suggestion found there is that a veterinarian should demand a substantial advance payment before admitting the patient to his hospital if the case seems doubtful. "If the animal does not appear to be worth the bill with prognosis very favorable." But the point I would like to know is to what extent of authority has a veterinarian for refusing admission of any case with any illness, regardless of prognosis? Should the animal die after being refused admittance to a veterinary hospital, would not the owner have a clear claim for damages if it could be proven that the case could have been cured if not refused? I have had this question on my mind for some time, and the article referred to prompted me to inquire further, trusting you could help me out.—H. A. J., Georgia.

Reply—A veterinarian may limit his practice in any way that he sees fit, as, for example, to small animals, swine, sheep or horses, or consultation. He may decline to do any practice whatsoever and still be within his legal rights. In other words, he may refuse any case he does not desire to handle, and he incurs no liability by so doing. He is as much entitled to demand cash in advance or a fee in advance as any other business or professional man; that is, he is fully entitled to it if he can get it.

There are only two conditions under which a veterinarian may incur liability by refusing to make a call or declining to accept a patient. One is where he has already taken the case. He must not dismiss it without giving the owner reasonable notice and ample opportunity to get another veterinarian. The other is where he has been doing a man's veterinary work for a time and the man has no reason to think he will

not continue to do it. Such a client must be given sufficient notice to enable him to get another veterinarian or the first veterinarian must attend the case long enough to enable him to get another veterinarian. If it is a case that will not be injured by such delay as the first veterinarian's refusal to treat it, he may decline it without liability.

The foregoing applies only to the legal requirements. Public sentiment in a given locality may make different demands, but they may be disregarded if one can afford it.—D. M. C.

HEMORRHAGIC SEPTICEMIA IN CALF.

I was called today to make an examination of a calf that had died. I made the examination, but I am not at all certain as to the cause of death. I am sending you a list of my findings, and would appreciate it if you can help me in making a diagnosis.

The subject was a grade Hereford calf, between four and six months old. On March 19 the calf was apparently in perfect health. The following day it was noticed that she was lame in the left hind leg and appeared dumpish, and the next day was unable to rise, death occurring about noon.

On autopsy I found the liver normal or a trifle dark; kidneys, lungs and heart normal; spleen normal as to size, but very dark and covered with hemorrhagic areas; intestinal tract normal or perhaps a trifle inflamed; belly muscles slightly infiltrated with a gelatinous substance; blood vessels, arteries and veins filled with dark blood, very frothy, especially in spleen; blood coagulated after about two minutes exposure; musculature normal as to color and consistency; bowel movement about normal; bowel contents normal or slightly fluid.

At first I suspected peracute blackleg, but later changed my mind, as we inspected the herd and all were apparently normal. I thought of anthrax and discarded it. My diagnosis was probably forage poison and a chance of hemorrhagic septicemia. I advised the owner to keep close watch of the herd for signs of any other cases.

This is my first experience with a case of this kind and while I am not anxious to display my ignorance I am not at all confident, and if my request is met by your approval I should greatly appreciate a reply with a diagnosis. If that is impossible, with the evidence I have furnished, I would welcome a little hint as to the possibilities in the case.—J. E. H., California.

Reply—Regarding your post-mortem examination on the calf, after careful study of the case, it is our opinion that the calf died as a result of hemorrhagic septicemia. This disease in nearly every outbreak is apt to act somewhat differently from previous outbreaks. In some cases an animal may come down with it maybe every week, ten days, or every two weeks. At other times they may come down in bunches, finding a new addition to the list of sick ones each day.

We would advise you, as you have already apparently done, to have the herd watched carefully, and should any more come down with the disease we would suggest that you immediately give them a liberal dose of sodium cacodylate. For instance, for calves five or six months old you may give them, if they are of average weight, as high as 30 grains; eight to ten months old, weighing in the neighborhood of 700 to 800 pounds, give them as high as 45 grains; adult animals, 60 grains. This is to be dissolved in from one-half to one ounce of sterile water and administered intravenously. You may also use, if you wish, the hemorrhagic septicemia biologics. The two agents will not interfere with the action of each other.

Of course, the sick should be immediately isolated from the well, and strange to say with hemorrhagic septicemia, a short distance, such as 200 feet, seems to prevent the communication of the disease from the sick to the well.—E. L. Q.

HORSE WHEEZES.

I am writing you in regard to a five-year-old bay mare weighing 1,500 pounds. This mare wheezes very loud when she arches her neck. She may trot right along and not show this until she arches her neck.

The owner reports that this mare has run at the nose at intervals all winter. No swelling of any kind can be seen from external examination Would long continued treatment on potassium iodid be of any avail?—W. I., Iowa.

Reply—The trouble may be due to several causes, some of them pathological and one a condition of malformation or habit. By the last I mean that an animal that is beefy around the throat and which arches the neck to a marked degree will make an increased noise in breathing, where there is no pathological condition. If this is the case with your patient an over-check bridle is the only remedy.

As to the pathological conditions causing this, it may be caused by an animal being a roarer and having the ailment only to such a slight extent

that the arching of the neck is required to cause sound. Such horses are sometimes referred to as partial roarers.

Another condition that will cause it is enlarged parotid glands, especially in connection with the arching of the neck at the throat. Chronic laryngitis may give rise to the increased sound when the neck is arched. A small nasal polypus may not cause a sound when the head and neck are carried without arching, but with the neck arched the polypus being pedunculated may fall into such a position as to cause a sound, but this would cause more of a snoring sound rather than a wheeze. The wheezing sound usually occurs in the throat. However, if you do not find that the overhead or overdraw check-rein overcomes the condition, then I would advise the administration of potassium iodid in two and a half to three-dram doses, three times daily, for your patient. It may have to be continued for two or three weeks.

In regard to the nasal discharge you should make a careful examination of the teeth and determine whether the discharge is due to a decayed molar root, with extension of infection into the sinus. If so, of course, the tooth will have to be extracted. If not due to a diseased tooth, put the patient on a mixture containing three-grain doses of arsenic trioxid and one and one-half drams of copper sulphate, to which may be added a little fenugreek or linseed meal, such a dose to be given mixed with the feed, three times daily. It may have to be continued for two or three weeks.—E. L. Q.

CONTAGIOUS ABORTION AND SULPHURETTED HYDROGEN.

I am treating a herd of thirty cattle for contagious abortion. Treatment consists of abortion vaccine for all animals and flushing the uterus of five aborted animals with Flavisol. All of these animals have been watered from a lake, the water of which is, according to analysis, exceptionally high in organic matter and sulphuretted hydrogen, the latter being evidently the product of decomposition. Is it possible that sulphuretted hydrogen may be associated with abortion? What are the toxic effects on cattle and horses if sulphuretted hydrogen has entered the system for a certain length of time? Please reply through your valuable paper.—C. H. G., Canada.

Reply—In the foregoing you suggest that sulphurated hydrogen may be the possible cause or contribtuing cause to infectious abortion. There is no such danger, unless the water containing the sulphurated hydrogen also contained the germs of the disease.

Regarding the possible toxic effect on cattle and horses of sulphurated hydrogen, as it may be taken in the drinking water; the toxic effect is nil. Of course, one must not lose sight of the fact that the sulphurated hydrogen may come from decomposition of animal matter and that it may not be the only contaminating influence in the water. If the source of water supply contained the bodies of animals which died of some contagious or infectious disease, the water may contain the germs of that or those diseases and in that way be a dangerous element, but sulphurated hydrogen itself is devoid of toxic properties.—E. L. Q.

BARRENNESS IN COWS AND BULLS.

In this section of the country we have had a great amount of trouble in getting cows to conceive, and some agricultural societies have gone out of existence because of the loss of valuable bulls (they having had to be sold for beef), inasmuch as the latter would seem to lose their usefulness after a couple of years of service, though still able to serve the cows.

These bulls have been more or less of local production. They are pure-bred Guernseys, Shorthorns, Holsteins and Ayrshires, and are of good type, conformation and extra good breeding. They are used according to regulations set forth for the use and exercise of such animals.

One breeder of pure-bred Guernseys has quite recently imported from New York state a pure-bred bull of good type, 15 months old, and is at present using this animal for breeding purposes.

The bull of course was imported with a straight bill of health, seems to be able to serve the cows in fine order, but has as yet caused only one heifer out of 15 or more females to conceive.

Not having any contagious abortion in this country so far, I have used various methods upon the females in order to alleviate this condition, if possible, but to no avail in the majority of cases. This condition, as you will readily understand, is becoming very serious for stock raisers, and it is practically up to me to try and overcome the trouble in one way or another. Having exhausted my knowledge and read all literature available upon the subject, I am as yet totally at sea as to what next to do, and am therefore coming to you for light upon the subject.—C. B. L., Nova Scotia.

Reply—Your query to us is answered fully in

an article on "Sterility" by Dr. J. F. DeVine, on page 215 of the May, 1920, issue of VETERINARY MEDICINE. I will add a suggestion or two in regard to the treatment of the bulls. I would recommend, based on actual experience, the use of a drug known as vetol, which is the commercial name for the active principal yohimbin. Perhaps you would prefer to use the fluid extract of yohimbe or tablets of yohimbe. Either preparation is of great value in sterility of functional origin only, and you will find it of especial value in the case of the bulls to which you refer. It is also of value in the female where there is no organic cause for the sterility, but in the cow the cause is usually organic and will call for manual or surgical treatment. On this score, however, Dr. DeVine's article, as above referred to, will give you the desired information.—E. L. Q.

INCOMPATIBILITY IN PRESCRIPTIONS.

I wish you would give me the following information as soon as possible:

A lumbering firm wanted a liquid tonic for its horses, and I mixed up a solution of strychnine sulphate and Fowler's solution, as follows:

℞

Fowlers sol. .....O iv
Strych. Sulph. ..... ʒ iv
Aquae .....O iv

Misce et Sig.—One tablespoonful three times daily.

When mixed together there was some precipitation. I sent this along with the instruction to "shake thoroughly before using." Is this safe for use or has some chemical reaction taken place which makes it unsafe or useless? Is there any way to mix these two together so as not to have this precipitation?

Can salol and nux vomica be given together in a drench?

Can carbonate of ammonia in solution be given with salol and nux vomica or with either—W. L. M., Canada.

Reply: Fowler's solution and strychnine is a rather dangerous mixture; the solution of potassium arsenite (Fowler's solution) being alkaline, slowly precipitates the strychnine (alkalis precipitate alkaloids from solution). If the solution of arsenous acid (liquor acidi arsenosi) is used instead of Fowler's solution there would be no such danger and the physiological effect would be the same.

In the mixture which you put up for your client, you could re-dissolve the precipitated strychnine and use the mixture by neutralizing the Fowler's solution by the careful addition of dilute sulphuric, hydrochloric or citric acid and testing with litmus paper, to make sure that the solution is neutral. However, if the mixture is thoroughly shaken and the dose quickly poured out, the danger will be reduced to a minimum, provided this is done thoroughly with each dose, as the danger in your prescription lies in the possibility of some horse receiving a toxic dose of strychnine, which has been precipitated, when the last dose or two is poured out. There is no chemical reaction in this combination, the danger being solely that of precipitation of the strychnine.

Inasmuch as lumber camp horses are usually big fellows, weighing 1,500 pounds and up, you should prescribe from one-half to three-quarter ounce doses, three times daily, of Fowler's solution or similar solutions of arsenic. The dose which you prescribe, two drams, is rather too small to be efficacious.

Referring to the admixture of salol and nux vomica, no chemical incompatibility exists between these two drugs. However, you must remember that salol is almost insoluble in water (1 in 2333), and, of course, powdered nux vomica is insoluble in water. You do not state what preparation of nux vomica you contemplate its admixture with. Should you use an alcoholic preparation of nux vomica it might be well for you to note that the salol is soluble in five parts of alcohol at 25 degrees C. (77 degrees F.), very soluble in hot alcohol, in ether, chloroform and fixed or volatile oils; also, in ten parts of 90 percent alcohol or one-third part of ether at 15 degrees C. (59 degrees F.), the addition of water, however, to a solution of salol is liable to precipitate the salol.

Salol cannot be combined with ammonium carbonate in solution, for the reason that salol is readily decomposed by alkalis. Nux vomica and ammonium carbonate may be combined.—E. L. Q.

DOSE OF CARBON DISULPHIDE FOR HORSE.

What is the proper dose of carbon disulphide, given in a gelatin capsule, for a horse weighing about 1,200 pounds?—L. M., Nebraska.

Reply: The average dose of carbon disulphide for a horse weighing about 1,200 pounds is from one-half to one ounce. The most satisfactory results seem to be procured by administering one-half ounce in a capsule every two hours for three doses; then about twelve hours afterward an aloetic purge should be administered.—E. L. Q.

Pointed Opinions on Live Topics

By READERS of VETERINARY MEDICINE

Mineral Deficiency and Abortion

ACCORDING to the best authorities on the subject one-twentieth of the animal body is made up of mineral matter, and so important are some of these salts that death will occur if they are withheld for a month.

We cannot overlook the specific bacterial cause of the majority of cases of abortion, but the deficiency of minerals in the animal system is due to faulty feeding and grazing on impoverished land is no doubt a highly contributory cause, more especially sterility and failure of recovery from the primary infection.

> It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

The function of mineral salts in metalbolism is to regulate the specific gravity and chemical reaction of the blood and other fluids of the body. They preserve the tissues from disintegration. Their great physiological mission seems to be to assist in metalbolism.

We all know the important part played by chemicals in plant life, where we add certain chemicals to change the condition of the soil that it may yield up its vegetable food nutrient units, without which one gets only half a crop and perhaps of poor quality.

The important factor in the recovery of any animal from a pathological condition to normal is not so much due to the direct action of medicaments as it is to the mighty repair forces of nature. Repair of damage to tissues caused by disease is retarded and often impossible if the mineral constituents of the system are below par.

The food ration of the average dairy cow is compounded from about three forage rations and a highly concentrated grain ration, with no choice in what the individual system craves.

The almost universal use of large quantities of silage in winter causes a hyperacidity of the system and requires a considerable lime or alkaline content to neutralize it. As a rule, the animal does not get this, and consequently a mineral deficiency of the system results.

Of late I have been experimenting in a practical way by using crude calcium phosphate together with sulphur and iron sulphate as a corrective for abortion and sterility with remarkable results. This method of treatment has been used only in stubborn cases of sterility that have seemingly failed to respond to the Williams treatment. However, in the future I shall plan to use it in all cases.

I have in mind a herd of nine cows that had for some time failed to breed. The owner stated that he had tried several bulls, but to no avail. He wouldn't invest sufficient money to defray the expense of examination and the Williams treatment, so I gave him a sufficient quantity of the bone meal and iron mixture for the entire herd. Eight of the herd have conceived and the ninth was sold for beef.

Dairy cattle are stable-fed and housed warm. To protect them from the wintry blasts of our northern climate they are not allowed to leave the stable during the winter months, and, of course, do not have access to winter pasture. They are usually fed, not to promote and protect the best physical condition of the animal, but to produce the most milk in the shortest time.

It is my opinion that the part mineral deficiency plays in sterility would seem to be explainable largely upon nature's compensatory theories, exemplifications of which are seen in everyday life. Thus an improper diet at a time when an unusual demand is being made on the system will result in outraged nature choosing its own prerogative between life and death.

It is difficult to solve the numerous questions of feeds and feeding which are daily problems

of the practitioner. Study of feeding conditions and their influence on pathological conditions should be stimulated.—P. R. Baird, Waterville, Maine.

TYPE A BOTULISM, A PASTURE DISEASE IN HORSES.

Since equine botulism was first recognized in America the extent of this intoxication in cattle, sheep, swine, horses and poultry in the United States, and even other countries seems an important consideration in the better protection of the live stock industry. The difficulties encountered in the clinical diagnosis of this disease suggest that any immediate progress which the veterinary practitioner might be able to record in the prevention of botulism may include the conservative use of a specific polyvalent antitoxin under field conditions.

Last year eight of nineteen clinical outbreaks of botulism in cattle encountered by veterinarians in Illinois proved positive to B. botulinus upon bacteriological examination. The widespread character of B. botulinus and its possible significance to the health of domestic fowls is further suggested as the result of bacteriological findings in specimens of so-called "limber neck" of poultry occurring in different localities of the Mississippi valley.

More recently Dr. J. H. McNeil, chief of the Bureau of Animal Industry of New Jersey, has been engaged in the control of an equine pasture disease, which veterinary and sanitary officials commonly designate as "forage poisoning." Several specimens of animal tissue, as well as one specimen of hay from the above outbreak, were examined for the presence of toxic anaerobes. Two tissue specimens from afflicted animals proved positive to B. botulinus, and from one of the above specimens a pathogen indistinguishable from B. botulinus type A was isolated.

The relation of this disease to other outbreaks of a similar clinical character are not known, but it is interesting to recall that during recent years enzootic or epizootic outbreaks of unknown etiology have been reported in horses on pasture in Nebraska, Texas, Kansas, Colorado, Iowa, Illinois, Kentucky, South Dakota and other states. The efficacy of botulinus antitoxin in protecting animals (mules and horses) against botulinus toxin in the food has been repeatedly demonstrated in the laboratory, and the results would seem to suggest the advisability of extending this specific treatment to exposed animals in suspicious clinical outbreaks. It further appears that suggestive information might thus be obtained relative to the extent and character of the disease or diseases in question, while bacteriological findings will probably in due time confirm or refute the specificity and value of the prophylactic treatment. Until a rapid method is devised of determining the type of botulinus intoxication in clinical cases the polyvalent antitoxin is preferred.—Division of Animal Pathology, Department of Animal Husbandry, University of Illinois.

LUXATION OF BOTH FEMURS IN COW.

I was called on March 20 to see a cow that the owner thought was paralyzed. I found the cow lying on the sternum, both hind legs abducted from the body, frog fashion. An examination revealed no broken bones. The cow was supported in slings and could sustain no weight on hind quarters. The hind legs, upon being brought under the center of gravity, would slip outward from the body. The cow was slaughtered. The autopsy revealed both femurs luxated upward and forward out of the acetabulum (ilium luxation).

I would like to know if readers of VETERINARY MEDICINE have ever seen luxation of both femurs at the same time, and if they have been able to reduce them.—S. G. M., Michigan.

PREPOTENCY OF STALLIONS AND JACKS.

The article in December VETERINARY MEDICINE by Dr. Cook, with answer by Dr. Cole, recalled a circumstance that used to be very perplexing to me, but in later years almost forgotten. While still a boy and some years before I ever thought of studying veterinary science, I was at the home of a man in western North Carolina who was a breeder of mules and jacks, also keeping for service a stallion. While there a neighbor brought two mares to be served by the jack. One of them, a young animal that had not been bred before, persistently resisted the jack, and the owner of the mares was preparing to leave when the attendant suggested serving with horse and following with jack. The owner objected, saying he wanted a mule colt. About this time the owner of the jack appeared and on learning of the situation offered to guarantee the progeny to be a mule under the method of service suggested. The mare was first served by horse and later accepted the jack.

At the time I was too young to be sufficiently interested to inquire if this was a general practice in such cases, but being in the same section

something over a year later I happened to see the owner of the mare, who told me that the mare "caught" from the service and that the foal was a mule.

On taking up the study of veterinary medicine I related the circumstance to my preceptor, who told me that he had heard from a breeder in Texas that the results in these cases were certain, but that he always doubted it. In later years I mentioned the matter to a number of breeders and veterinarians, but found none who ever heard of the practice.

Dr. Cook's article has revived my interest in the matter, and I would be glad to hear further discussion of it.—J. E. Hodges, Maiden, N. C.

Regarding the report made by Dr. D. R. Cook, in the December, 1920, issue of VETERINARY MEDICINE, under the caption "Relative Prepotency of Stallions and Jacks," will say that myself and several breeders of this locality, with years of experience in breeding both stallions and jacks, wish to dispute the claim made by the breeder quoted by Doctor Cook, as we have never found it so, that is, we have not found the jack to show prepotency to the stallion.

This has been common belief among the laity, but has never been proven so in this locality.—H. F. Emick, Warren, Ind.

BULLETIN ON ROPY MILK.

A discussion of the ropy milk problem, including the cause, circumstances surrounding its developments, together with methods of prevention, is given by H. A. Harding and M. J. Prucha in Bulletin 228, issued by the Illinois Agriculture Experiment Station. A thorough disinfection of utensils and cooling tanks has proven effective in suppressing the development of ropy milk. An epidemic involving a large pasteurizing plant is described. This bulletin may be had without charge upon application.

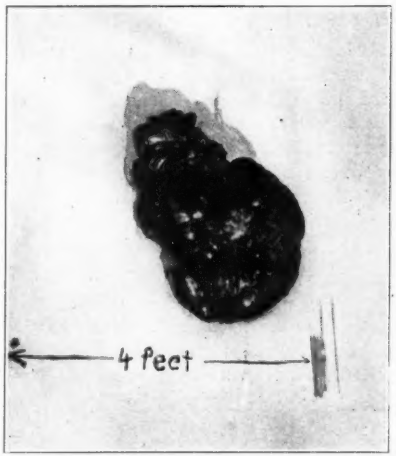
ROUND CELL SARCOMA.

I have a case to report that may be of interest to some of the readers of VETERINARY MEDICINE.

I was called to see a cow, the owner of which said was not doing well. I found a Holstein cow that was practically a living skeleton; her pulse was 55, respiration about normal, temperature 102°, bowels normal. She ate grain well, but ate very little hay. The owner said that this cow felt good at times and would fight the other cows; then again she would stand around and seem listless. He also stated that he could not stand this cow in a stanchion because if he did she would extend her fore feet forward and her hind feet backward until she fell down. He also stated that the cow had been unthrifty and sick for a period of five months.

I suspected tuberculosis and suggested the tuberculin test, which was given and proved negative.

The cow died about two days later and an autopsy revealed the following rather startling condition: I found a tumor (evidently the parent tumor) involving all of the mesenteric lymph



A Case of Round-Cell Sarcoma.

glands, which weighed 68 pounds; also metastasia involving practically all the lymph glands in the intestinal tract and thoracic cavity, these varying from the size of a hen's egg to the size of half-bushel measure. These tumors proved to be round-cell sarcomata. The external lymph glands were not enlarged.

The accompanying illustration is of the tumor, which weighed 68 pounds.—T. G. Gaukel, D. V. M.

HEMORRHAGIC SEPTICEMIA IN DOGS.

I noticed in the March issue of VETERINARY MEDICINE, under the caption "Hemorrhagic Septicemia of Domesticated Animals," a paragraph referring to the possibility of this disease existing in dogs. It seems possible that there may be a type of this infection present in the canine family as well as in other species of animals. Being a breeder of collie dogs, I wish to give my experience with a peculiar and most virulent infection recently met with in our animals.

Case 1—A ten-month-old collie bitch had been given distemper bacterin at two and six months

of age, three inoculations being given three days apart. She was noticed to be very nervous and quivering on first day of illness, and did not care to go outdoors unless compelled. She was not inclined to eat much, but showed no marked symptom of distemper. I suspicioned this might be the cause, and gave the following:

℞ Quinine hydrobromide
Ammonium chloride.....aa 64 grs.
Echafolta ..... 2 drams
Spts. vini rect.....½ oz.
Guaialyptol .....32 M.
Treacle nigra qs. ad..... 4 oz.
M. et sig.: 1 dram every four hours.

In addition, 1 mil of ethereal camphorated oil with beechwood creosote was given every 24 hours; also sodium cacodylate in 7½-grain doses.

The second day the patient was much worse; temperature 106; pulse 150; respirations extremely labored, and animal very weak and unable to walk. Ethereal camphorated oil with creosote was applied over the lungs, chest and throat, and covered with a jacket of absorbent cotton and gauze. On the third day death ensued, with patient apparently choking and fighting for breath.

Case 2—Six-month-old bitch came down a few days later, the symptoms being much the same and death following in about a week.

Case 3—Nine-month-old bitch, ailing slightly for three days, with hacking cough, suddenly showing pneumonic symptoms. The above treatment was given, but the patient died in two days, choking and gasping for breath, and apparently in great distress, with much groaning.

Case 5—Eight-month-old male, symptoms per symptoms for about four days, then labored respirations and death in about three days following.

Case 5 — Eight-month-old male, symptoms more like distemper, treatment same as above, but throat was swabbed out daily with equal parts of tr. chloride of iron and glycerin, which seemed to check secretions in the throat, profuse discharge from upper air passages. At times the patient seemed to rally and eat, then suffer a relapse. After several days' illness 10 cc. of hemorrhagic septicemia bacterin was given as an experiment. The day following the patient appeared much better, but became worse the next day and gradually declined until death followed about three weeks after first symptoms appeared.

An autopsy was made on this animal and it was found that half of the lobes of the lungs were consolidated, the heart greatly hypertrophied, and also the kidneys, the latter showing many petechia similar to the turkey-egg kidney of hog cholera; the spleen was enlarged and friable; profuse hemorrhagic areas were found all through the bowels, these areas being bright red but the blood itself was very dark and thick. In attempting to give an intrajugular injection twelve hours before death it was found that the circulation was poor and the blood too thick to flow through the needle. In many respects the clinical picture on autopsy was similar to hemorrhagic septicemia of hogs. There was never any diarrhea present in any of these animals.

Whether this condition was anything other than distemper with pneumonia complications, or whether it was "flu," hemorrhagic septicemia, or what, I cannot say. The disease seemed to end as suddenly as it began. Other animals which were exposed and susceptible, and which have never had distemper, have shown immunity throughout the attack and have exhibited no symptoms. None of the animals affected lived, none had ever had distemper or had ever been sick a day with anything, and all had been vaccinated for distemper two and three times previous to their sickness, and all received several injections during the same of the bacterin. No treatment seemed to cause any noticeable improvement in the animals, except that the hemorrhagic septicemia bacterin given the last patient seemed to cause improvement the day following; at least the dog improved, and whether the bacterin did it, I do not know.

If any of the readers of your journal can shed a little light on this subject, through theory or practice, I would be very glad to hear opinions on the matter, and would be especially interested in hearing whether others have had any similar experience, and what their treatment was, if successful.—H. A. Gould, D. V. M., Belvidere, Ill.

FEEDING FARM HORSES.

Our experimental work with colts, draft horses and mules at farm work has shown that the best results are obtained when legume hays of good quality make up one-half to two-thirds of the total amount of roughage fed. Carbonaceous roughages, such as timothy and prairie hays, oat straw, and corn stover may be used satisfactorily to make up the balance of the ration. Although economy in horse feeding should be practiced throughout the year, lower costs should not be secured at the expense of efficiency. Each spring many farm horses are so thin and unthrifty that they cannot render satisfactory service when needed. It is false economy to starve a horse

through the winter, because he is a money loser when put to work. Liberal feeding wisely done will hit the bull's eye every time.

During the late fall and winter months much use may be made of oats straw and well-cared-for corn stover. These foods are good for the horse and cheapen the rations. During the remainder of the year mixed clover and timothy hay or alfalfa and timothy may be fed. For horse feed alfalfa should not be cut too soon, as very leafy, fine-stemmed, pea green hay is inclined to be washy; the stemmy, first-cutting alfalfa hay is preferable.

It is always a good rule to feed hay to an empty manger, i.e., to insist that everything which is edible be cleaned up. Work horses do better when approximately one-half of the hay is fed at night and the balance divided between the morning and noon feeds. Idle horses require little grain when good roughage is fed in abundance. Bulky rations are the best for the idle horse. Feed only enough grain to maintain proper condition. Hard-worked horses, when idle, should have their grain ration cut in half, and strict adherence to this practice would save much money for team owners.

Oats is the best single grain, but it is not always available and sometimes the price makes its use prohibitive. Corn is a great source of energy and may satisfactorily make up part of the grain ration of most work horses. Combinations of corn, bran and oil meal are good substitutes for oats when fed with timothy and prairie hay. When legume hays constitute an important part of the roughage, corn may be used to make up a considerable part of the grain ration. Corn and timothy hays do not make a very good ration for the work horse in either winter or summer, especially in summer. Bran is the most useful mill feed for horses and is used when no legumes are fed. Once or twice a week give a bran mash, which should be warm during cold weather, instead of the regular evening feed of grain. It is usually better to feed grain in three equal feeds per day.

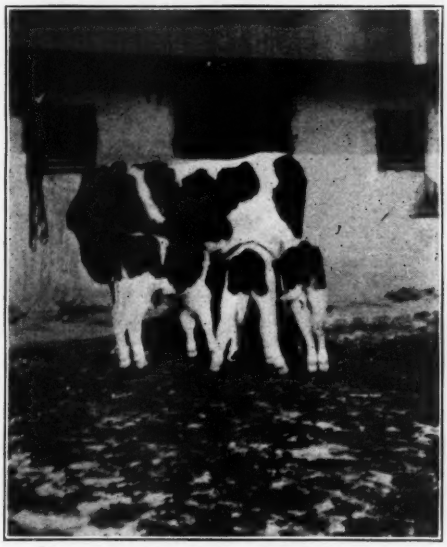
Most trials that have been recorded show that grinding is not very profitable, but I am inclined to believe that with increased availability of belt power, we might do some grinding to advantage. A good oats crusher is a valuable piece of equipment where many horses are fed.

The amount of feed required varies with different individuals. At the Illinois Station, one trial with mature farm work horses indicated a requirement of from one and one-fifth to one and one-third pounds of grain per cwt. per day and from one to one and one-fourth pounds of hay per cwt. per day. Usually, it is not possible or desirable to weigh rations. Grain should be measured carefully and the amount of hay may be estimated closely by the experienced feeder.—J. L. Edmonds, Professor University of Illinois.

BULL-CALF TRIPLETS.

The accompanying illustration shows a comparatively rare occurrence, that of triplets. All three of them are bull calves and all are alive and well. The picture was taken when the calves were six weeks old, at which time they weighed 179, 161 and 149 pounds.

Note how evenly marked they are. The mother is a grade Holstein and is a valuable asset to her owner. However, if she continues the triplet habit her overproduction of veal may cause a fall in the market price of that commodity.



Holstein Mother and Her Bull-Calf Triplets.

During her parturition she was attended by Dr. H. C. Moyer, Blooming Glen, Pa., who must be a great accoucheur to be able to accomplish such an operation so successfully.

HOG-CHOLERA "BREAKS."

Writing to the Animal Pathology Exchange of the University of Illinois, the following opinions were expressed in regard to hog-cholera "breaks":

Dr. Thomas Lingafelter, Camargo, Ill.—Limited doses of virus were given at first in the

treatment of hogs. The following year much larger doses of virus were employed, and since that time the doses of serum, as well as the dose of virus, have been increased. For pigs up to 40 pounds from 2 to 3 c.c. of virus are given, while from 40 up to 125 pounds from 3 to 4.5 c.c. of virus; larger hogs are given up to 5 c.c. In this connection "breaks" after treatments have been reduced to a minimum, and herds so treated have not contracted cholera to my knowledge. The dose of serum is increased from 5 to 10 c.c. These deductions are made from three years' experience, including the treatment of approximately 10,000 head of hogs.

Dr. W. B. Van Cleave, Crisman, Ill.—I have not used as large doses of virus as other practitioners have. The condition of the hogs at the time of vaccination and the after-care have a great deal to do with the results of immunization of hogs against cholera.

Dr. W. Lester Hollister, Avon, Ill.—Personally I believe that 0.5 c.c. of virulent virus will produce as much immunity in a hog as 4 c.c. or 10 c.c. The first few years I vaccinated hogs we gave 0.25 c.c. to 1 c.c. of virus, most shoates getting 0.5 c.c. of virus and 25 c.c. of serum, and "breaks" were unknown. It was after I increased the dose of virus to 1.5 c.c. and serum to 35 c.c. and 45 c.c. that I observed so-called "breaks." I believe that carelessness in handling the virus from the time it leaves the laboratory until the time of injection is responsible for at least some and probably a large number of irregularities.

Dr. James L. Montooth, Bradford, Ill.—I have not used less than 2 c.c. of virus on the smallest pig for the last two years, while at the present time I am using 3 c c. with very favorable results. Plenty of serum and virus means no "breaks." If virulent virus could be obtained fresh without any preservative, results from immunization would probably be more uniform.

FOOT-AND-MOUTH DISEASE PROPHYLATIC SERUM DISCOVERED.

The dread foot-and-mouth disease, which has caused the loss of so many cattle in this and other countries, will no longer be feared if the recent dispatch from Paris announcing the discovery by a commission of French experts of a serum for the prevention of this disease proves authentic, and if this serum can be produced in sufficient quantities to inoculate all susceptible cattle against the plague.

Animal disease experts of America have great confidence in the French scientists, Professors Roux, Nocard, Carre and Vallee, who are credited with this discovey, according to Dr. C. C. Lipp, professor of veterinary medicine at the South Dakota State College, consulting veterinarian of the South Dakota Experiment Station and director of the state animal health laboratory.

If the hopes of these men are realized, he says, there will be no more reason to worry about this disease. Granting that such a serum has been discovered, it now remains to be seen how it can be produced in the quantities demanded.

Several outbreaks of the disease have occurred in the United States, the last of them several years ago causing a great loss. The only effective method of stamping out the disease heretofore has been to slaughter all cattle affected and thoroughly disinfect the premises.

PRACTICAL POINTERS.

To make a very good inexpensive liniment for general use, one can try this:

Ol. terebinth.
Aq. ammon. .....āā ℥ viii
Acid. oleici ..... ℥ ii
Ol. gaultheriae (synthetic)..... ℥ i
Aquae .....q. s. ad. C j

Take a gallon bottle, and to the first ingredient (in which alkanet root has been steeped) add half the water, shaking well; add the second and shake all together; then add the oleic acid, and fill the bottle up, adding the oleum gaultheria last. To obtain a pink solution, add some red coloring tablets or fruit color instead of the alkanet root, which gives a yellow color.

In removing an over-ripe placenta, if one will anoint his right arm with a mixture composed of one ounce oil eucalyptus to seven of cottonseed oil, to which has been added aniline or alkanet, the odor can be very easily removed by washing. This obviates anything sticking to the hairs of the arm or in the pores. Rubber gloves are more for style than utility; if arm-length ones were made it would be different.

For collar sores or crazy sore neck, 50 percent mercurial ointment will be found excellent, of course, cleansing the parts as well as possible. Adding some charcoal and oil of bitter almonds to this well-known ointment will increase its efficiency.

As a tonic, inexpensive, easy to administer, the tasteless liq. potassii arsenitis will be found hard to beat. Tablespoonful doses on plenty of oats will form a combination pleasing to the patient. When fixing teeth a small bottle of

this given to the owner will bring back more work. As an appetizer to milk cows add one ounce of nux vomica to a pint of the above.

To destroy a sheep for autopsy don't try to knock it in the head, as you may strain your back hitting hard enough; don't try to shoot it unless you have a new Springfield rifle. Cut its throat, bend back the neck, fracture the vertebrae, and avoid a lot of trouble.

After wandering all over the materia medica and back again it is pretty hard to beat Old Man Reeks' treatment for equine impactions. Also, the barium chloride and tartar emetic combination has saved lots of grief in treating bovine digestive troubles.

If all practitioners will use their heads and less expensive medicines, there will be a decided drop in many of the common drugs used. Raw linseed oil manufacturers have no doubt noticed a decided decrease in the use of their time-honored product in veterinary practice, and many other things now hovering around exorbitant prices will get off their perch with a concerted movement on our part.

Let us have more formulae with inexpensive ingredients, and more business short cuts. By doing this we save money for our clients, make more for ourselves, and lessen profiteering in drugs.—E. T. Baker, Moscow, Idaho.

TEXAS RELEASED FROM SHEEP-SCAB QUARANTINE.

A new quarantine order issued by the United States Department of Agriculture releases the entire state of Texas from quarantine for sheep scabies. The order became effective April 15. Texas counties which until recently have been subject to quarantine regulations and which are now released are: Concho, Crockett, Edwards, Kimble, Menard, Pecos, Schleicher, Sutton, Terrell, Tom Green and Valverde.

According to veterinarians in the Bureau of Animal Industry there are a number of cases of sheep scab still existing in Texas, but the disease is so well under control that a continuance of the quarantine in the "Lone Star State" is considered no longer necessary. According to the new order promulgated by the department, the following areas of the United States are still under quarantine: California,—Mendocino, Sonoma, San Joaquin, Stanislaus, Fresno, Merced, Madera, Tulare, King and Kern counties and the island of San Clemente. Louisiana—The parishes of Allen, Beauregard and Vernon.

Sheep may be shipped, transported or otherwise moved from the quarantine areas to any other part of the country only in accordance with the regulations of the Secretary of Agriculture for the prevention of the spread of scabies in sheep.

THE MECHANICAL COW.

The accompanying cartoon, taken from the Los Angeles *Times*, is a picturization of Henry Ford's idea that the cow can be displaced by the

"IT IS A SIMPLE MATTER TO TAKE THE SOME CEREALS THAT A COW EATS AND MAKE THEM INTO A MILK WHICH IS SUPERIOR TO THE NATURAL ARTICLE — THE COW IS THE CRUDEST MACHINE IN THE WORLD" —HENRY FORD.
RATTLE
RATTLE
BUZZ
BUZZ
GAS
FORD ONE COWPOWER MILK ELIVUER
TROUBLE
STALE

Cartoon Appearing Under the Caption of "Do We Hear a Horse-Laugh?"

chemist taking the same cereals and other food materials used by her and putting them through a chemico-mechanical process and turning out a better and purer milk than does the cow.

TREAT HOGS EXPOSED TO CHOLERA WITHOUT DELAY.

Un'ess early action is taken to diagnose the cases and apply proper treatment when disease appears in swine herds, losses are inevitable. The chances are many that the trouble is cholera, and under such circumstances delay is dangerous, for when that disease has spread and progressed in the herd the loss of many hogs may be expected.

Early attention in an outbreak of hog cholera is essential for the successful treatment of the herd. It has been told repeatedly that

anti-hog-cholera serum is not a cure; its use is primarily intended as a preventive agent against cholera, and as such it is universally recognized as the only reliable treatment While the serum seemingly has had some favorable effect when administered to sick hogs in the very early stage of the disease, swine owners should not depend upon the product to save any number of animals after they have developed visible symptons of hog cholera.

In Farmers' Bulletin 834 (revised) issued by the U. S. Department of Agriculture, attention is called to the fact that the serum is most efficacious when administered as a preventive. "While the serum is regarded as most efficacious when administered as a preventive," the bulletin points out, "it seems to have some curative value, provided it is administered when hogs are in the early stage of the disease. But very little benefit can be expected from the treatment of hogs that are visibly sick."

In a bulletin issued recently by Dr. R. C. Reed, Chief of the Bureau of Animal Industry, Maryland State Board of Agriculture, appears the following: "An analysis of the data obtained from sick herds vaccinated in Maryland during 1919 shows that over one-fifth of the swine had died or were too sick to treat before the herds were immunized." Information from other states where control work is being conducted points to a similar lack of prompt attention in reporting outbreaks of hog cholera.

Much of the criticism and unfavorable comment against anti-hog-cholera serum is due to the fact that farmers delay the use of the product for too long a period after cholera has reached the herd. When many of the animals show symptons of the disease and the temperature reveals a high fever, it is not reasonable to suppose that serum will do much toward limiting losses. Therefore, the warning is again given to treat the animals at the very first sign of cholera in the herd.

Or better still, if there are reasons to suspect that the hogs have been or are exposed to infection, they should be immunized before they have fallen victims. In sections where there are no known outbreaks of cholera there does not seem to be any need for the use of an expensive treatment.

Reports indicate that farmers and swine owners are remiss in guarding against the introduction of infection, and are generally inclined to expect too much of anti-hog-cholera serum as a curative agent.

Copies of Farmers' Bulletin 834 may be had free upon application to the Division of Publications, Department of Agriculture, Washington, D. C.

UNUSUAL CONDITION FOUND IN COW'S LUNG.

The subject was a red cow, common grade, shipped from Tina, Mo., June 30, 1920, and found dead in the car on arrival at Kansas City Stock Yards, July 1. The animal was thin in flesh, with no visible external injuries evidenced on removal of ribs from the right side; extensive pleural, peritoneal and diaphragmatic adhesions were noted; also false tissues involving diaphragm, esophagus and part of the reticulum adhered to the ventral surface of the thoracic cavity on the right side; left lung was apparently normal; right lung adhered to the diaphragm nearly the entire extent of the basal border, and it was noted to be about four times normal size and of irregular shape. Upon incision it was found to contain 12 quarts of coarse food and a small quantity of liquid, all trace of lung tissue having been eliminated from the diaphragmatic, cardiac and the posterior portion of the apical lobes. The inner surface of this sac resembled that of the rumen and, to all appearance, functioned as such.

A careful dissection of the tissues revealed an opening from the esophagus into this false rumen at a point about 2 inches posterior to the bronchus for the apical lobe, and which when dilated had a diameter of about 1¼ inches. The inner aspect of this opening presented an irregular and elongated shape and resembled the musculature of the esophageal groove, through which, I have reason to believe, the process of regurgitation was successfully performed. No other outlet from this sac could be found, the food content being identical with that found in the rumen and undergoing the same process of fermentation.

My conclusions were that this condition had existed from birth and that the animal had always presented an unthrifty appearance. The remarkable feature to me in this case was that the anterior portion of the apical lobe was functioning as a respiratory organ, while what should have been the posterior portion of the apical lobe, the cardiac and diaphragmatic, were functioning as a digestive organ.—H. R. Thompson, Kansas City, Mo.

Matters of Current Interest

MAINE ASSOCIATION TO CHANGE VETERINARY LAW.

The first quarterly meeting of the Maine Veterinary Medical Association was held at the Augusta House, Augusta, Me., on January 12. During the forenoon the members attended the session of the state legislature. The business meeting was called at 2 p. m. Twenty-one members answered the roll call.

The following were elected officers for the ensuing year: President, Dr. W. H. Lynch, Augusta; vice-president, Dr. C. F. Davis, Rumford Falls; secretary-treasurer, Dr. P. R. Baird, Waterville.

A legislative committee composed of Drs. L. S. Cleaves, C. L. Davis, C. F. Dwinal, A. Joly, M. E. Maddocks and W. H. Lynch was elected and instructed to frame and introduce a bill in the legislature changing the present law so it will read: "Only graduates of veterinary colleges approved by the B. A. I. will be eligible to take examination of the Maine State Board of Veterinary Examiners."

Dr. C. F. Davis presented a paper on "Mastitis of the Cow"; Dr. A. J. Neal, "A Case Report"; Dr. C. W. Purcell, "Immunity to Tuberculin," and Dr. P. R. Baird, "Mineral Deficiency." Discussion of these papers followed until a late hour, when after voting to meet in Bangor, April 13, the meeting was adjourned.—P. R. Baird, Secretary, Waterville, Me.

SHORT COURSE IN POULTRY GIVEN AT KANSAS COLLEGE.

Recognizing the increasing importance that poultry practice is assuming to the modern veterinarian and the advisability for the practitioner to capably handle this work, a short course in poultry for veterinarians was given at the Kansas State Agricultural College, Feb. 22-24.

The daily program was as follows: First Day.—8 a.m., "Field Culling Problems," Prof. N. L. Harris; 9 a.m., "Body Changes and Egg Production," W. A. Lippincott; 10 a.m., Culling Practice; 11 a. m., Culling Practice; 1 p. m., "Differential Diagnosis of Poultry Diseases," Dr. R. F. Beaudette; 2 to 4 p.m., "Anatomy and Diseases of Mammary Glands in Other Animals," Dr. R. R. Dykstra, J. H. Burt and William McLeod.

Second Day.—8 a.m., "Pigment Changes and Egg Production," Prof. W. A. Lippincott; 9 a. m., Culling Practice; 10 a.m., Culling Practice; 11 a.m., "The Molt in Relation to Egg Production," Prof. N. L. Harris; 1 p.m., "Poultry Sanitation," Dr. R. F. Beaudette; 2 to 4 p.m., Exhibit of diseased uteri and discussion of sterility in other animals, by Dean R. R. Dykstra, William E. Muldoon and H. F. Leinhardt.

Third Day.—8 a.m., "Conformation and Egg Production," Prof. L. F. Payne; 9 a.m., Culling Practice; 10 a.m., Culling Practice; 11 a.m., Culling Practice; 1 p.m., "Poultry Vaccines," Dr. R. F. Beaudette; 2 to 4 p.m., sterility of cattle clinic, Dean R. R. Dykstra, William E. Muldoon and E. J. Frick.

Dr. H. Graffe of the B. A. I. discussed and demonstrated the intradermal test. The regular clinic of the veterinary division afforded a number of interesting cases. About 60 practitioners were in attendance.

FIRST ANNUAL MEETING OF PRINCE EDWARD ISLAND V. M. A.

Proper diagnosis and methods of bacteriology were among the subjects discussed at the annual meeting of the Prince Edward Island Veterinary Medical Association, held at Charlottetown, P.E.I., Canada, Feb. 17.

Dr. J. A. Allen, Charlottetown, the newly elected president of the association, read a paper on "The History and Fundamental Methods of Bacteriology," bringing out many valuable points which were elaborated in the discussion. Dr. C. J. Bowsfield read a paper on "Stable Hygiene and Its Influence on a Proper Milk Supply," which proved so good it was voted to put in printed form. Dr. W. G. Church followed with a paper on "The Value of Proper Diagnosis by the Veterinarian." Dr. W. H. Pethick, the retiring president, presented a paper on "Pictou Cattle Disease." This disease, which baffled leading pathologists and bacteriologists in Canada and England, was assigned by the government to Dr. Pethick for clearance, with the result that it was completely eradicated from Prince Edward Island.

The election of officers resulted as follows:

Dr. A. J. Allen, Charlottetown, president; Dr. I. E. Croken, Charlottetown, vice-president; Dr. W. G. Church, secretary-treasurer. It was decided to hold at least three meetings during the coming year, with one on the west end of the island, possibly at Summerside.—W. G. Church, secretary, Summerside, P. E. I., Canada.

ALL ABOARD FOR THE A. V. M. A. MEETING IN DENVER.

Every veterinarian who can possibly do so should attend the American Veterinary Medical Association meeting in Denver, September 5-9. Summer excursion rates of one and one-third fares will be in effect until October 1. In purchasing tickets those who plan to attend can get tickets to Denver or to Colorado Springs via Denver, in case they wish to see the sights of Colorado Springs. The summer excursion tickets are also good going over one road and returning over another.

The Burlington railway has been selected as the official route from Chicago to Denver. This will enable those from Chicago and eastern points to travel together to Denver. Leaving Chicago Saturday evening, Sept. 3, at 11 o'clock, Denver will be reached Monday at 7:30 a. m. Delegates can return over another route any time until Oct. 1. Full particulars will be given later, and a program of the meeting will be mailed to every member about Aug. 1.

Many veterinarians are planning to drive to Denver, and arrangements are being made so that those going from Kansas City and vicinity can drive through together. The roads through the West are usually in excellent condition at this season of the year. There are free camping sites in Denver and other western cities. Those who are planning automobile parties to Denver should write to the secretary, giving date and place of starting and the itinerary, so that others may join them on the route.—N. S. Mayo, Secretary.

Where the A. V. M. A. Meeting Will Be Held.

A night view of the Municipal Auditorium in Denver, Colo., where the sessions of the American Veterinary Medical Association will be held at its next annual convention, Sept. 5-9.

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Is a preacher's parrot a bird of prey (pray)?

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The exposure of animals, and especially swine, to diseased conditions on the ordinary farm may be compared to automobile risks in a large city. Every day and every hour there exists danger. To own an automobile in a city and feel secure from financial loss by accidents or theft, the owner carries complete insurance against fire and theft, collision, property damage and liability insurance to prevent personal loss by damage suits in case of injury to a person or persons.

Vaccines containing but a single organism may be compared with fire and theft insurance or any other single policy. Protection against one possible damage may exist, but not against the possibilities of the other things that can and do happen. In other words, the fullest protection and peace of mind may be obtained by a mixed insurance of proper amount and with reliable companies.

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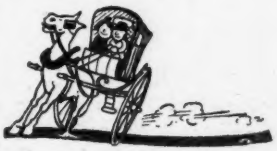
With Glover's Mixed Infection Vaccines you will have in one product what others may have in several products; for instance, one firm may advertise a product for Swine Plague or Hemorrhagic Septicemia, another for Pig Scour, etc. We will admit that from a commercial standpoint it means more sales and more money, and from that angle may be good business; but our ideal is of different nature. Our aim is to maintain a reputation of being practical, reliable, and a success, with products that do what others claim to do and more.



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THAN DILUTED SERUMS BUT IT ALSO POSSESSES RELATIVELY GREATER IMMUNIZING VALUE.

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Water will not immunize hogs

MANITOBA VETERINARIANS DISCUSS TUBERCULOSIS.

When 25 percent of the children who die from tuberculosis receive the infection from drinking milk from cows affected with the disease, it is time, said Dr. F. Torrance, veterinary director of Canada, at the annual meeting of the Veterinary Association of Manitoba, held in Winnipeg, Feb. 15, for us to awake to the necessity of doing something to protect them. He pointed out that the people of Canada must realize that the fight against bovine tuberculosis is not only an economic one for the live stock breeder and the live stock owner, but a question which involves the health of the entire community.

Dr. Torrance called attention to the regulations which municipalities could now enforce with respect to dairies, and stated that the cost was practically nothing to the municipalities, and low to the dairyman whose dairy was inspected and cows tested. The regulations have been in effect in Saskatoon for some time, and the trial there has demonstrated their effectiveness. He stated: "No one could tell the number of lives that have been saved through the supply of pure milk; at any rate, the community knows its children are not drinking milk from cows affected with tuberculosis."

In the enforcement of the regulations for testing cattle, the co-operation of the owners must be secured. Outlining the work of the department in the direction of securing herds free from tuberculosis, he said it has been discovered that the ravages of this disease are such that it must have a serious influence on the live-stock supply of the nation. Accredited herds are increasing in the United States, and similar steps have been taken during the past year in Canada. The department, he stated, was receiving the heartiest co-operation of the owners of live stock, and 397 herds had been tested.

Dr. Torrance stated that he hoped to be able to get the assistance of general practitioners in testing cattle, and it was proposed to have a list of veterinary surgeons throughout the country qualified for this service. With this object in view an examination was held in Winnipeg on March 15 for these practitioners. Tests would be conducted for live-stock owners at the owner's expense.

Incidentally, Dr. Torrance mentioned, commenting upon a discussion regarding the establishment of a laboratory in Manitoba, that it might be possible to utilize the equipment at the Manitoba Agricultural College for such a purpose until the federal authorities considered they were in a

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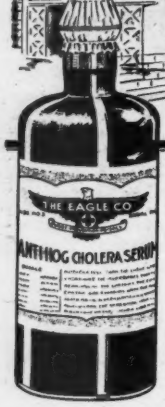

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position to provide funds for such an institution.

Dr. H. Colebourn of Winnipeg addressed the meeting on "Bloodless Castration," which has been carried on to some extent in Europe. Dr. W. A. Harron of Beulah, Man., presented the subject of "The Colt and Its Care from the Veterinarian's Standpoint," and Dr. H. R. McEwen of Stonewall, Man., discussed a number of interesting cases of digestive disturbances most frequently met with in practice. President John Bracken of the Manitoba Agricultural College spoke on the relation of veterinary science to agriculture. Short addresses were also given by Dr. A. G. Husband, Belmont; Major S. Robinson, Brandon; Dr. J. A. McLeish, district supervisor of the Federal Meat Inspection Division, Winnipeg; Dr. W. A. Shoults, professor of veterinary science, Manitoba Agricultural College, anl Dr. J. A. Stevenson, Union Stockyards, St. Boniface.

Dr. Munn, the retiring president, in his address referred to the improvement in the course of instruction at the Ontario Veterinary College under the principalship of Dr. C. D. McGilvray.

The officers elected were: President, Dr. F. W. Bryant, Dauphin; vice-president, Dr. J. S Mack, Neepawa, and secretary-treasurer and registrar, Dr. J. B. Still, Winnipeg. The council for the coming year will be composed of Dr. J. B. Still, Winnipeg; Dr. J. Munn, Carman; Dr. W. Hilton, Winnipeg; Dr. F. W. Bryant, Dauphin; Dr. J. S. Mack, Neepawa; Dr. H. R. McEwen, Stonewall, and Dr. W. H. T. Lee, Minto. The examining board consists of Drs. J. Munn, W. Hilton and H. R. McEwen.

NEBRASKA VETERINARY EXAMINERS TO HOLD EXAMINATION.

The Nebraska State Board of Examiners of Veterinary Medicine will hold its next regular examination in Lincoln, June 20. Applications should be on file not later than June 1. For information and application, address H. H. Antles, Department of Public Welfare, State House, Lincoln, Neb.

CENTRAL MICHIGAN VETERINARY MEDICAL SOCIETY MEETS.

A meeting of the Central Michigan Veterinary Society was held at the City Club, Jackson, Mich., March 25, at which the following program was presented: Dr. George W. Dunphy, Michigan state veterinarian, read a paper on "Contagious Abortion as It Can Best Be Handled by the General Practitioner"; Dr. T. F. Krey, Detroit,

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paper on "Veterinary Biologicals"; Dr. W. H. Haynes, Jackson, paper on "Canine Diseases"; Dr. H. Preston Hoskins, Detroit, paper on "Immunity Against Infectious Diseases of Animals." The latter also reviewed the latest discoveries in the treatment of hog cholera, contagious abortion, hemorrhagic septicemia, tuberculosis and other diseases. Dr. L. A. Ruff, of Marshall, had charge of the question box, and Dr. Judson Black, secretary of the veterinary examining board, gave a talk on "Veterinary Legislation." Dr. H. F. Roberts, president of the society, presided at the meeting.—W. N. Armstrong, secretary-treasurer, Concord, Mich.

KANSAS TO HAVE NEW VETERINARY CLINIC BUILDING.

The Kansas legislature has made an appropriation of $100,000 for a new veterinary clinic building to be erected at the Kansas State Agricultural College. The building will be used exclusively for veterinary clinical purposes.

The classrooms and laboratories of the Division of Veterinary Medicine in the Kansas State Agricultural College are at this time housed in a commodious three-story stone building perfectly adapted for veterinary instruction. With the addition of a new clinic building the facilities at the Kansas State Agricultural College will undoubtedly be equal to those of any veterinary school in the United States.

The fact that the Kansas legislature made such a large appropriation for hospital purposes indicates that it esteems very highly the value of veterinary services, especially since a large number of the legislators are engaged in livestock or agricultural pursuits.

DR. PURVINES DIES.

On March 15 Dr. Lewis G. Purvines of Ashland, Ill., had an argument with a client over a small account. During the altercation which followed the client drew a knife and stabbed the doctor through the left lung. He was in a very critical condition for some time but rallied and hopes were entertained for his recovery, but complications followed, which terminated in his death on April 14.

Dr. Purvines after his graduation from the Chicago Veterinary College in 1916, located at Bosco, Ill., where he was married and remained about a year He then went into partnership with Dr. Wielerton in Porter, Ill. After a year he moved to Ashland, Ill., where he developed a fine

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My placing this preparation on the market, now, for the first time is not the result of hasty conclusions because it has served me so well, but I am offering it to the profession only after exhaustive consultations with the most eminent authority in America on veterinary materia medica.

This remedy is composed of ethyl nitrite, salicylic acid, oil of cajuput, fluid extract capsicum, fluid extract ginger, camphor, rectified oil of turpentine and mineral oil. The dose is eight ounces, to be repeated every hour, in severe cases, until relief is evident. Two to four quarts should effect a recovery. The first case treated will convince you of its superior merits.

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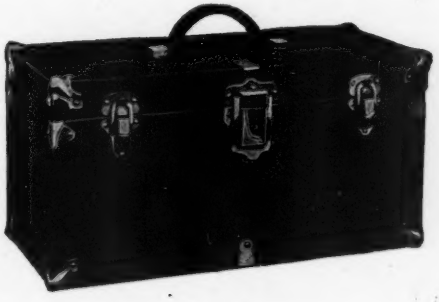

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practice and where the future looked most bright for him. He was held in high esteem by the community in which he resided.

He was a member of the Masonic Order at Ashland, Consistory at Springfield, and the Ausar Temple of Shriners also at Springfield.

MARE GIVES BIRTH TO TWIN COLTS —HORSE AND MULE.

A brood mare belonging to William Matthews, a rancher, living near Porterville, Calif., gave birth to twin colts—one a horse and the other a mule. This unusual occurrence has aroused considerable interest among horsemen in that locality.

DR. F. M. BURCH HAS TUBERCULIN TEST LAW PASSED IN MISSOURI.

Dr. F. M. Burch of Green City, Mo., who represents Sullivan county in the Missouri general assembly, introduced a bill requiring all herds containing five or more cows from which any milk or milk products are sold to be tested for tuberculosis. We have received word that the bill has passed both houses of the assembly.

We congratulate Dr. Burch for his attainments, as we fully realize that it requires an inconceivable amount of very hard work to get a bill of that nature passed by a state legislative body, as it is usually opposed by 75 or 80 percent of the owners of the involved animals. The doctor's victory is a great credit to himself and to the veterinary profession, which stands as a bulwark between animal and man as regards the communicable diseases. We also congratulate the populace of the state of Missouri, who are indeed fortunate in having an advocate like Dr. Burch to fight their health battles for them.

IOWA TO HAVE STATE BIOLOGICAL LABORATORY.

A bill introduced in the Iowa state legislature by Representative Donhowe provides for the creation of a biological laboratory at Ames for the distribution of vaccines, serum and additional biological products, and for other work of the veterinary division.

TUBERCULOSIS ERADICATION DISCUSSED AT INDIANA MEETING.

The Jay-Randolph (Indiana) County Veterinary Medical Association held a live and interesting meeting March 2 in connection with the farmers and live stock raisers of the two counties. It is the intention to hold monthly meetings. The colts were born dead, but the mare is doing nicely.

Purity's Announcement

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Our former president has severed all connections with the management of this Company in order to take up other work.

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Correspondence solicited from qualified veterinarians.

Lathrop Serum Co. Lathrop, Mo.

Among other matters brought up for discussion before the association was a talk on tuberculosis by Dr. E. B. Haskins, chief of the Bureau of Animal Husbandry of Indianapolis, who is also inspector in charge of tuberculosis eradication in Indiana. Dr. J. D. Campbell of Geneva, Ind., read an instructive paper on "Horse Power Versus Motor Power."

NORTHWESTERN VETERINARIANS TO HAVE JOINT MEETING.

A meeting of the Washington State Veterinary Medical Association will be held in conjunction with the Oregon and British Columbia association at the Butler Hotel, Seattle, Wash., July 14-15. An effort is being made to enlist the support and co-operation of the Idaho association with a view of having it participate in the joint convention. Dr. J. W. Kalkus of the State College is in charge of the program on behalf of the Washington men, being assisted by Carl Cozier, secretary of the Washington association. They have extended a cordial invitation to eastern veterinarians who may be in the west at that time to attend the convention.

MASSACHUSETTS TO HAVE ERADICATION CONFERENCE.

The Massachusetts Veterinary Association with the Massachusetts Division of Animal Industry, jointly with state and federal employes engaged in co-operative tuberculosis eradication in the New England states, together with veterinary practitioners and representatives of the livestock industry, are to hold a tuberculosis eradication conference in Boston, Mass., June 22-24.

An interesting program has already been arranged for this meeting, and special arrangements are being made for entertainment of the ladies. It is hoped that veterinarians or persons interested in such a meeting, residing outside of New England, will avail themselves of the opportunity of meeting the New England veterinarians at this conference.

DOCTORS DISAGREE IN REGARD TO MOTHERHOOD OF MARE MULE.

"Motherhood for a mare mule is impossible." In these words Dr. Bennett, Chillicothe, Mo., veterinarian for more than a quarter of a century, disposed of the Dillon, Mont., story that a colt recently was born to a mare mule there.

ALEXANDER

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Alexander Biological Laboratories.....Muscatine, Ia.
Southeastern Laboratories.....39 Luckie St., Atlanta, Ga.
Wilmer Veterinary Supply Co.....14 North Third St., Memphis, Tenn.
White Cross Serum Company.....800 St. Claire Ave., St. Louis, Mo.
Great Western Serum Company.....Exchange Ave., Chicago, Ill.
Dr. H. W. Wise.....200 East Main St., Owosso, Mich.
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Veterinary surgeons, horse breeders and producers of heavy work stock have scoffed at the intermittent claims coming from various sections of the country that a mare mule has become a mother. Now comes Dr. J. W. Butler, Montana state veterinarian, upholding the owner of the Dillon mule in the statement that such a freak of nature is possible. "But it is a pipe dream," said Dr. Bennett. "John J. Ingalls was right when he declared that 'the mule was without pride of ancestry or hope of posterity'."

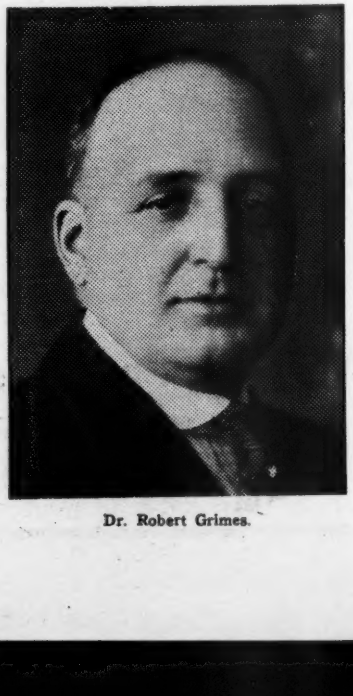
Dr. Daniel O'Loughlin has located in Hamilton, N. Y. He formerly practiced in Oneida, N. Y.

VETERINARIAN RUNS FOR MAYOR OF KANSAS CITY.

Two veterinarians were candidates for mayor of Kansas City, Kan., in the primaries held there recently. They were Dr. D. H. Burcham of the Standard Serum Company and Dr. Robert Grimes of the Eagle Laboratories.

Dr. Grimes captured the nomination, leading a field of five. In the election which followed, Dr. Grimes went down to defeat in a hotly contested and spirited race.

Dr. Grimes is widely and favorably known in the profession. His friends are in the hope that he will be a candidate in the next campaign, feeling confident that he would make an excellent and popular official.



Dr. Robert Grimes.

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WOMEN'S AUXILIARY FORMED AT NEW YORK COLLEGE.

The wives and daughters of the members of the faculty and alumni of the New York State Veterinary College, at New York University, New York, N. Y., on April 1, organized a women's auxiliary for the purpose of promoting the social side of college activities. Officers were elected as follows: Mrs. W. Horace Hoskins, president; Mrs. Roscoe R. Bell, vice-president; Mrs. William Herbert Lowe, secretary, and Mrs. Robert S. MacKellar, treasurer. It was decided to hold monthly meetings on the second Thursday of each month.

Nathan Straus, multi-millionaire and philanthropist of New York, has offered the state of Georgia a fully equipped laboratory to be located in Augusta and to be devoted to fight and eradicate tuberculosis in cattle.

—o—

Dr. Elias S. Walmer, well known veterinarian of Washington, D. C., died recently at the age of 65 years. For a long time he was on the faculty of the U. S. College of Veterinary Surgeons. His son, Dr. Morris Walmer, is with the Bureau of Animal Industry.

Ninety veterinarians registered for a five-day course of instruction on tuberculosis, tuberculin testing and tuberculosis eradication at the College of Agriculture, University of Nebraska, Lincoln, Neb., from March 7 to 11, inclusive. The course was given for those who desired to qualify for tuberculosis eradication work.

—o—

Several cases of rabies among cattle known to have been bitten by a dog are reported from the Milam community, north of Denton, Texas.

—o—

Dr. S. Odle has recently located in Artesia, Calif.

—o—

Dr. Seth Law is establishing a fully equipped and modern hospital in Loomis, Calif.

—o—

Dr. R. M. Hampton, formerly of Sheldon, Ill., is now located in Watseka, Ill.

—o—

A good attendance greeted the Northwestern Veterinary Association's semi-annual session at Sioux Falls, Iowa, last month. The program was replete with excellent papers.

—o—

Dr. William F. Osterholtz, former assistant to

George Stratford Oakum Company
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Offiers an up-to-date, four-year, graded course in Veterinary Science and leading to the degree of Doctor of Veterinary Medicine (D.V.M.). It is a well equipped college, having excellent facilities for both scientific and practical instruction, a new building especially designed for clinical and surgical instruction, an intimate relation with courses in Animal Husbandry and a faculty devoting its entire time to teaching offers unexcelled opportunities. Begins its eleventh year September 28, 1920. Tuition free to residents of Michigan. For college bulletins and information, address,
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NEW YORK UNIVERSITY
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Twenty-five Veterinarians on the Teaching Staff. Exceptional Clinical Opportunities
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Dr. C. E. Baxter, Oakland, Iowa, has purchased the practice of Dr. J. A. Jessen and is now located at Shelby, Iowa. Dr. Jessen of Shelby, Iowa, contemplates moving to California.

—o—

Dr. Walter Post of McClelland, Iowa, has entered partnership with Dr. C. E. Baxter of Oakland, Iowa.

—o—

Dr. L. L. Crocker, formerly of Kamiah, Idaho, has moved to Nez Perce, Idaho, where he has taken over the practice of Dr. Aiken, who has moved to Peon River, Canada.

—o—

Dr. G. B. Cash was recently elected president of the village council of Grant, Mich.

—o—

Dr. F. C. McCoy will be a candidate for mayor of Columbus, Ind., in the next election to be held there.

—o—

Dr. J. E. Hodges, a veterinarian, is mayor of Maiden, N. C., which lays claims to being the fastest growing town in Piedmont county, N. C.

—o—

Dr. Harry P. Stout of Anna, Ill., has joined Dr. J. F. Devine's staff at the Orange County Veterinary Hospital at Goshen, N. Y. Twenty years ago there were but two veterinarians in Goshen. Now there are seven.

—o—

Dr. J. H. Rietz, formerly connected with the serum laboratory at Iowa State College, Ames, Iowa, is now in charge of hog-cholera eradication work for the Bureau of Animal Industry in West Texas.

—o—

Dr. R. W. Hoggan, state veterinarian of Utah for the last four years, resigned his office recently to engage in other business.

—o—

Dr. M. V. Burgett, formerly of East St. Louis, has located in Newark, Ill.

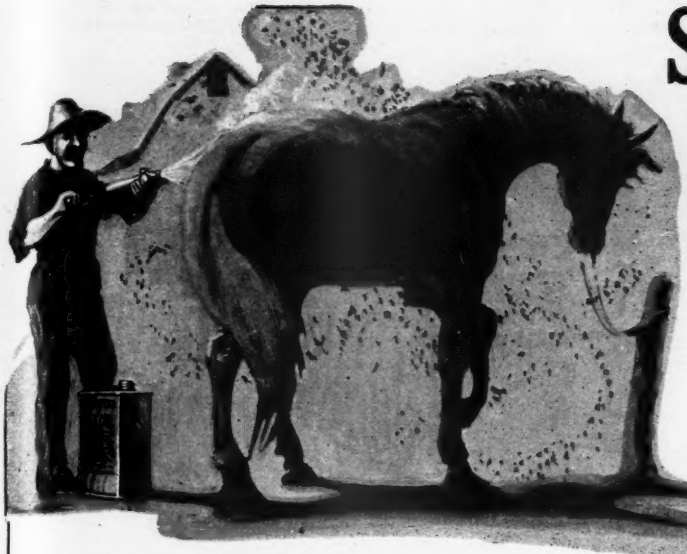
—o—

Twelve seniors will graduate from the Washington State College, Veterinary department, next month.

—o—

Dr. W. Horace Hoskins has sold the property on which his hospital is located in Philadelphia. A factory will be erected on the site.

SWAT THE FLY!



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EXAMINATION FOR VETERINARY LICENTIATES IN ILLINOIS.

This examination which was originally set for May 2 and 3 has been postponed, as it was found that it would interfere with the examinations of senior students at the various veterinary colleges. The Department of Registration and Education will announce a new date in the near future, which will fall soon after the completion of the present term of the colleges.

Dr. E. M. Sullivan of Milwaukee, Wis., is considering the establishment of a new veterinary hospital in his city. According to plans prepared it will be the most elaborate privately owned veterinary hospital in the United States.

—o—

We have been informed that Dr. G. H. Oakes, Hunter, N. D., is the proud father of a baby born Dec. 20, 1920.

—o—

Dr. C. L. Reece of Savannah, Mo., has recently employed a new office girl, her name being Mary Elaine Reece, who was born to Dr. and Mrs. Reece March 30.

—o—

Dr. E. M. Nighbert of the Bureau of Animal Industry, until recently stationed at Jacksonville, Fla., has been assigned to Great Britain in connection with international inspection and quarantine work. After spending a few days in Washington and New York he sailed May 1 for his new post.

—o—

In the recent case of the State of Indiana vs. Dwight Eichelberger the evidence showed that the defendant had been practicing veterinary medicine and surgery in White county, Indiana, without license and that he had previously been found guilty and fined for a like offense in the same county. Eichelberger was found guilty and was given a penal farm sentence which suspended for 90 days, in which time he is expected to pay his fine and costs of the trial. The defendant claims to be a horse trainer as well as a veterinary surgeon, and it is understood at this time that he has left Indiana and is in Kentucky. The prosecuting witness in both cases was Dr. H. Fairfield of Monticello, Ind.

—o—

Dr. B. F. Kaupp, poultry investigator and pathologist at State College Station, Raleigh, N. C., author of "Poultry Diseases and Anatomy of the Domestic Fowls," etc., and also a frequent contributor to the pages of VETERINARY MEDICINE,

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C. E. ACKERMAN, D.V.M.

Licensed A. P. A. Poultry Judge
CHILLICOTHE, MO.

has just received the signal honor of appointment by the North Carolina State Department of Agriculture as a delegate to the first world's poultry congress to be held at The Hague the fore part of September. He is planning to leave the United States the first week in July to attend the British national meeting at London and then spending the time between this meeting and September in the study of poultry problems in Europe.

—o—

Many members of the profession will regret to learn of the death of the mother of Mrs. W. Horace Hoskins of New York City. She died last month at the age of 93 years.

—o—

Dr. B. W. Heath of Princeville, Ill., contemplates leaving soon for Whitter, Calif., where he will make his future home.

—o—

Dr. Frank Tefft, 59 years old, a member of the 1892 Chicago Veterinary College class, died at his home in Elgin, Ill., early this month.

—o—

Dr. Guy Sharp, formerly of Angola, Ind., is now located in Hamilton, Ind.

—o—

Dr. W. B. Hobson of Asheville, N. C., has been named veterinarian for Buncombe county, N. C.

—o—

Dr. David W. Cochran of New York City, well known to hundreds of members of the profession, died at his home on March 27. Dr. Cochran was regarded as one of the most successful veterinarians in the United States. He was graduated from Columbia Veterinary College in 1879 and from the American Veterinary College in 1880. For many years, in addition to conducting a general practice in New York, he operated a horseshoeing shop. A few months ago he presented to the New York State Veterinary College an anvil and forge which he used in his shop. This will be used in teaching classes in horseshoeing at the college. In early life he invested wisely in New York real estate and amassed therefrom a considerable fortune. Dr. Cochran was a familiar character at American Veterinary Medical Association meetings for the last 20 years. He was possessed of a charming.

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FOR SALE—Growing practice in Iowa, county seat town, good for $7,000 or $8,000, and is one of the best pure-bred live stock centers of the state. Will sell practice, office and hospital equipment, including drugs, instruments and car. Will include fine house and lot in this deal. Reasons for selling, health. This is a real one. Answer 603, care Veterinary Medicine, Chicago.

FOR SALE—Large number of used veterinary books for sale cheap, at big bargain. List and prices sent on request. Address 608, c/o VETERINARY MEDICINE, Chicago.

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WANTED—Opening as assistant, or location, by graduate veterinarian (Ohio State Veterinary College) in some good stock-raising community, preferably Ohio. Age 30. Experience in sterility and general practice. Address 596, care Veterinary Medicine, Chicago.

WANTED—Location in Iowa, general practice. Would consider position as assistant or partnership proposition. By 1918 graduate Chicago Veterinary College, age 26, married. Address 606 Veterinary Medicine.

POSITION WANTED—Graduate "A" grade Veterinary College. Eight years' experience, both city and country practice. Best references, temperate habits, good appearance. Capable of handling practice alone if necessary. Address 607 Veterinary Medicine.

POSITION WANTED—Graduate veterinarian with three years' experience in city and mixed practice desires position as assistant to veterinarian doing city practice. References; unmarried. Address No. 602, care Veterinary Medicine, Chicago.

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WANTED an assistant. Registered in Ohio. Salary and expenses and commission. Give particulars about your past experience, age, etc. Location North Central Ohio. County seat town. Address, 612 VETERINARY MEDICINE, Chicago.

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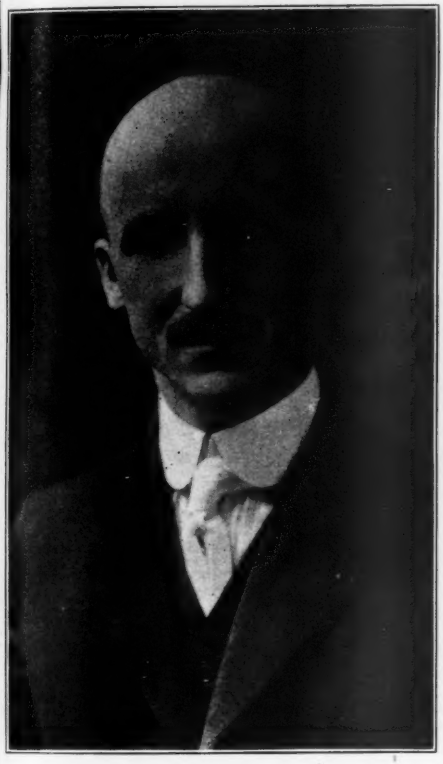
102 North Davidson St. Indianapolis, Ind.

lovable personality which endeared him to hosts of friends.

—o—

Dr. W. A. Walcott, one of the best known veterinarians in the central states, died at his home in Madison, Wis., March 16. A slight infection of the hand which developed into blood poisoning caused his demise. Dr. Walcott was secretary of the Wisconsin State Veterinary Medical Association, in which office he established a wide acquaintance and formed many friendships. He was a man of sterling character, a hale fellow well met, and his passing will be felt not only by his widow and his friends but by the profession in general. Dr. Walcott was 44 years old and was a graduate of the Chicago Veterinary College.



Dr. W. A. Walcott.

—o—

Dr. John B. Jones died at his home in Atlantic City, N. J., March 16, of pneumonia, following a brief illness. He was born in Allentown,

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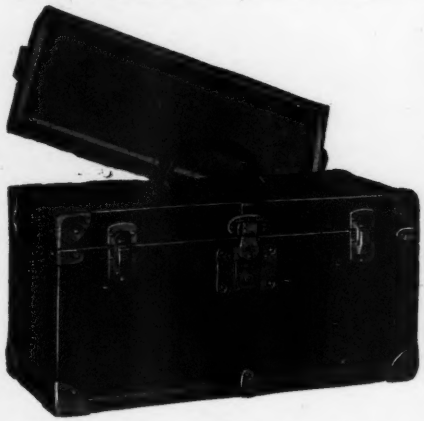

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Price: 19" case $7.00.

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N. J., May 11, 1863, and was graduated from the New York College of Veterinary Surgeons in 1897, after which he took up practice in Atlantic City. Dr. Jones was a member of the chamber of commerce of Atlantic City, a former officer of the Veterinary Medical Association of New Jersey, and was also one of the founders of the New Jersey state scholarship fund in veterinary science established at New York University. He is survived by a wife and daughter.

—o—

Dr. Alvin W. Shnell of Princeton, N. J., died March 23. He was an alumnus of the veterinary department of the University of Pennsylvania, a member of the Veterinary Medical Association of New Jersey, and one of the founders of the New Jersey scholarship fund in veterinary science established at New York University.

—o—

Dr. John H. McKee, for a number of years a practicing veterinarian at Eldora, Ill., was killed in a coal mine accident there early last month.

—o—

Dr. Daniel E. Cranz, a graduate of Ohio State University, class of 1914, died at his home in Akron, Ohio, recently under mysterious circumstances. Shortly before Dr. Cranz died he declared that he had taken poison. It is not known whether the poison was taken accidentally or was self-administered. Dr. Cranz served overseas in the veterinary corps.

—o—

Dr. Frank McLaren, 75 years old, died at his home in Plainfield, Ill., last month. He graduated from the Chicago Veterinary College 30 years ago, and for a long time practiced in Joliet.

PUBLICATIONS OF INTEREST TO THE VETERINARIAN.

Treatment of Equine Ascaris and Oxyuriasis. By MAURICE C. HALL, Ph.D., D. V. M.; ROBERT H. WILSON, D. V. M., AND MEYER WIGDOR, M. A.

Reprint No. 176, from the J. A. V. V. M. A., October, 1918, Parke, Davis & Co.,

In this paper the authors have shown that equine intestinal strongylidosis, contrary to what might be supposed, is a disease readily amenable to treatment so far as the removal of the adult worms from the intestine is concerned. It further confirms the idea that equine oxyuriasis is readily amenable to anthelmintic treatment, and

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that equine ascaridiasis is not readily amenable to anthelmintic treatment by therapeutic doses of safe anthelmintics.

Control of Lice on Horses, with Especial Reference to Winter Conditions.

By MAURICE C. HALL, Ph.D., D. V. M.

Reprint No. 166, from the Veterinary Journal, July, 1918, Parke, Davis & Co.,

This paper gives a report on experiments conducted on the infestation of horses with lice during the winter in the temperate zone, where horses are exposed to infestation during part or all of the year. The conclusions are valuable, but too extensive for this brief review. Those interested will do well to secure a copy.

Observation Regarding Pathological Conditions in Fowls.

By B. F. KAUPP, B. S., M. S., D. V. M.

North Carolina Experiment Station, West Raleigh, N. C.

This reprint contains the report of a number of hitherto unpublished observations regarding diseases in fowls that have been made in the Poultry Pathological Research Laboratory of the North Carolina Experiment Station during the past few years.

The diseases dealt with include: hepatitis, nephritis, and splenitis in a duck; the depluming louse of the fowl; curvature of the spine in young fowls; purulent pericarditis in a fowl; inflammation of the shell gland; open joint in the cockerel and tumefied ova in the hen.

Parasites and Parasitic Diseases of Sheep.

By MAURICE C. HALL, Ph.D., D. V. M.

Farmers' Bulletin 1150, U. S. Department of Agriculture, Washington, D. C.

According to the author most of our loss in sheep, mutton, and wool is traceable to animal parasites, as sheep suffer comparatively little from bacterial diseases. Parasitized animals do not usually have fever; they are, however, unthrifty. This unthriftiness may have a fatal termination. Lambs and young animals suffer most. Parasitic eggs pass in the manure, usually. The treatment is admirably described, while pasture rotation, use of forage crops, feeding from racks or bare floors, draining or filling swamps, and restraint of wandering dogs are measures of value. Veterinarians and stockmen find this publication of value.